MAHATMA GANDHI UNIVERSITY
of
MEDICAL SCIENCES & TECHNOLOGY
JAIPUR

Syllabus

M. Sc. Clinical Nutrition & Dietetics

(4 SEMESTERS P.G. DEGREE PROGRAM)

2023-24

Recommended by Committee of Courses Allied Health Sciences at its meeting held on …..... and approved by faculty and Academic Council at its meeting held on 28/4/2023

NOTICE

1. 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.

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

RULES & REGULATIONS OF
M. Sc. Clinical Nutrition & Dietetics
PROGRAM CODE: - **MSC0523**
(4 SEMESTERS P.G. DEGREE PROGRAM)

1. INTRODUCTION:

Objectives/aims of the course:
The course is designed to acquire knowledge in students to recognize "Health for all" as a national goal & right of all citizens and by undergoing training, student will be able to fulfil his/ her social obligations towards realization of this goal, students will learn various aspects of National policies on health & devote him/ her to its practical implementation, they will develop scientific approach, acquire educational experience for proficiency in profession and promote healthy living, student will be able to learn different aspects of Nutrition applicable to daily living & how quality of life can be provided by preventing & curing diseases, he/ she will be able to identify clinical needs of patients & design diet regime for them

Programme Outcome:

1. Students will be aware & develop an attitude for health & fitness.
2. Will develop a sense of adequate nutrient intake by self & by society
3. Will develop promotive, preventive, curative & rehabilitative aspects of common nutritional & therapeutic problems
4. They will develop skill of planning menu in an artistic & scientific manner to fulfil patient's & community's physical nutrient needs & psychological satisfaction as well

2. TITLE OF THE PROGRAM:

M. Sc. Clinical Nutrition & Dietetics

3. DURATION OF THE COURSE:

Duration of the course: 2 Years (4 Semesters)

4. MEDIUM OF INSTRUCTION:

English shall be the medium of instruction for all the subjects of study and for examination of the course.

5. ELIGIBILITY FOR ADMISSION:

B.Sc. (Clinical Nutrition & Dietetics/ Food & Nutrition/ Home Science/ Food Technology or graduates in Science subject who have covered a minimum of four courses out of the following: Biochemistry, Food Microbiology, Basic Nutrition, Clinical Nutrition, Therapeutic Nutrition, Human Physiology, Diet Therapy/ Diet in Diseases). Minimum 50% marks in the aggregate of above examinations from a recognized University.

6. PROCESS OF ADMISSION:

Admission to M. Sc. Clinical Nutrition & Dietetics Program shall be made on the basis of written entrance examination conducted for the purpose.

7. RESERVATION POLICY:

Reservation in admissions shall be applicable as per policy of the State Government.

8. ENROLLMENT:

Every candidate who is admitted to M.Sc. Clinical Nutrition & Dietetics Degree Program in Mahatma Gandhi Institute of Allied Health Sciences shall be required to get himself/herself enrolled with the Mahatma Gandhi University of Medical Sciences & Technology (MGUMST) after paying the prescribed eligibility and enrolment fees.

A candidate shall deposit enrolment fees along with tuition fees at the time of his/her admission to the course. Such a candidate who fails to submit, to the college Principal, duly filled enrolment form along with original documents including migration certificate required for enrolment within prescribed period then after he/she shall pay late fee applicable at that time. No student will be allowed to appear in the end of semester examination without his/her enrollment .

9. REGISTRATION

A candidate admitted to the M.Sc. Clinical Nutrition & Dietetics degree course shall register his/ her name by submitting the prescribed application form for registration duly filled in by remitting the prescribed fee to the MGUMST within 30 days from the cutoff date prescribed for M.Sc. Clinical nutrition & Dietetics degree course.

10. ATTENDANCE:

Minimum 75% attendance is required in each year, both for theory and practical classes separately, student with deficient attendance will not be permitted to appear in end of semester examination.

11. WORKING DAYS:

Each semester shall consist of not less than 120 working days including examination.

12. CONDUCTION OF THE END OF SEMESTER EXAMINATION:

End of semester examination shall be conducted twice in a year with an interval of six months. Even Semester examination shall be conducted after 6 months of odd semester examination

13. ELIGIBILITY TO APPEAR FOR END OF SEMESTER EXAMINATION

Student is required to have minimum 75% attendance (in theory and practical separately) /to make him/her eligible to Candidates failing in one or more, subject in a semester will be required to appear in their failing subject in the next examination of the same semester next year.

A candidate will have to clear all the subjects of First to third semester before appearing at fourth semester university examination.

14. APPOINTMENT OF EXAMINER & PAPER SETTER

- All the examiners - Paper setters, Theory examination answer books evaluators, External and internal Examiners for Practical examinations shall be appointed by the president of the University from the panel submitted by HOD/Convener of the respective COC through concerned dean of faculty.
- Paper setters shall be external.
- Practical examiner can be appointed to evaluate answers sheets.
- Professor/ Assoc. Professor /Assistant Professor/Lecturer/Allied Health Professional having PG qualification and 5 years' teaching experience after PG in respective field is eligible to act as Internal/External examiner of theory/practical examination.

15. SCHEME OF EXAMINATION

The End of Semester Examination or EOSE for the Course shall be conducted semester wise at the end of every semester.

i. Theory

(a) There shall be five Theory papers in each semester of the study.

(b) Each Theory paper examination shall be of 3 hours duration and of maximum 70 marks.

(c) Continuous Assessment or CA shall be of 30 marks for each Theory Paper.

(d) 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.

Pattern of question papers (Annexure 1)

(g) Passing Marks: A candidate will have to obtain at least 50% marks including continuous assessment in each theory paper to pass.

II. Practical and Viva-Voce Examination

(a) At the end of each semester there shall be practical and viva-voce examination of 200 marks. It shall be conducted after the Theory examination is over. A candidate will have to obtain at least 50% marks in practical and viva-voce examination

(b) Practical and viva-voce examination shall be of 140 marks (Practical 100 marks + viva voce 40 marks) and continuous assessment of sixty marks.

(c) The pattern of practical examination shall be as follows –

Semester	Practical Marks					Practical Examiners
	EOSE (End of Semester Examination)			Total Marks	Min. Pass Marks	
	Practical	viva-voce	CA			
I to IV Each	100	40	60	200	100	One Internal & one External Examiner

III **Result**

1. Candidate have to obtain at least 50% marks separately in each Theory paper including continuous assessment and a minimum of 50% marks in the practical examination including viva-voce for him to be declared pass.
2. A Candidate who has failed in a Paper (s) will reappear in respective paper(s) in next examination of the same semester next year.
3. Candidate who has failed in Practical examination will reappear in practical examination only in next practical examination of the same semester.

IV. Supplementary Examination

1. There shall be a supplementary examination of IV semester only within two months of the declaration of the result of the main examination of IV Semester.
2. Continuous assessment marks obtained in the concerned failed paper(s)/practical shall be carried forward for working out the result of next Theory paper(s) and/or practical examination.
3. If a failing candidate, wants to improve his/her Continuous assessment marks shall be allow to do so. In case he does appear for improvement or gets lesser marks in continuous assessment, his earlier marks will be considered for working out the result of the failing subject.

V. Promotion to the Next Semester

1. A candidate who has passed or failed in one or more subjects shall be promoted to respective next semester.
2. A candidate will be allowed to appear for the IV semester examination only when the backlog of all papers (theory papers and practical) of I semester to III semester exams including elective papers (if any) is cleared.
3. The student is required to clear all the End of Semester Examination within 4 years from the year of joining of the Program otherwise he/she will have to leave the course.

M. Sc. Clinical Nutrition & Dietetics (Marks Distribution of Semester – I Examination)

Course/Paper Name	Course/Paper Code	Credits	Theory/ Practical/Viva			Pass Marks
CORE COURSES			**EOSE**	**CA**	**Total**	50 % aggregate including continuous assessment marks separately in theory and practical.
Anatomy	MSC0523S101T	8	70	30	100	
Physiology	MSC0523S102T	8	70	30	100	
Basics of Nutrition & Dietetics	MSC0523S103T	8	70	30	100	
ELECTIVE COURSES (ANY TWO)						
Healthcare services & its applications	MSC0523S104T	5	70	30	100	
Computer Applications	MSC0523S105T	5	70	30	100	
Nutraceuticals & Functional Foods	MSC0523S106T	5	70	30	100	
PRACTICAL/ABILITY ENHANCEMENT COURSE						
Practical & Viva	MSC0523S107P	6	140	60	200	
TOTAL	**06 (05 Theory Paper 01 Practical)**	**40**	**490**	**210**	**700**	

M.Sc. Clinical Nutrition & Dietetics (Marks Distribution of Semester – II Examination)

Course/Paper Name	Course/Paper Code	Credits	Theory/ Practical/Viva			Pass Marks
CORE COURSES			**EOSE**	**CA**	**Total**	50 % aggregate including continuous assessment marks separately in theory and practical.
Advance Nutritional Biochemistry	MSC0523S201T	8	70	30	100	
Advance Food Microbiology	MSC0523S202T	8	70	30	100	
Food Science & Quality Control	MSC0523S203T	8	70	30	100	
ELECTIVE COURSES (ANY TWO)						
Molecular Nutrition	MSC0523S204T	5	70	30	100	
Healthcare Technology	MSC0523S205T	5	70	30	100	
Total Quality Management in healthcare	MSC0523S206T	5	70	30	100	
PRACTICAL/ABILITY ENHANCEMENT COURSE						
Practical & Viva	MSC0523S207P	6	140	60	200	
TOTAL	**06 (05 Theory Paper 01 Practical)**	**40**	**490**	**210**	**700**	

M.Sc. {Clinical Nutrition & Dietetics Marks Distribution of Semester – III Examination)

Course/Paper Name	Course/Paper Code	Credits	Theory/ Practical/Viva			Pass Marks
CORE COURSES			**EOSE**	**CA**	**Total**	50 % aggregate including continuous assessment marks separately in theory and practical.
Human Nutritional Requirements	MSC0523S301T	8	70	30	100	
Upcoming trends in human nutrition	MSC0523S302T	8	70	30	100	
Public Health & Community Nutrition	MSC0523S303T	8	70	30	100	
ELECTIVE COURSES (ANY TWO)						
Sports Nutrition	MSC0523S304T	5	70	30	100	
Legal & Medical Issues in hospital	MSC0523S305T	5	70	30	100	
Cognitive & Social Psychology	MSC0523S306T	5	70	30	100	
PRACTICAL/ABILITY ENHANCEMENT COURSE						
Practical & Viva	MSC0523S307P	6	140	60	200	
TOTAL	**06 (05 Theory Paper 01 Practical)**	**40**	**490**	**210**	**700**	

M.Sc. Clinical Nutrition & Dietetics (Marks Distribution of Semester – IV Examination)

Course/Paper Name	Course/Paper Code	Credits	Theory/ Practical/Viva			Pass Marks
CORE COURSES			**EOSE**	**CA**	**Total**	50 % aggregate including continuous assessment marks separately in theory and practical.
Biostatistics & Research Methodology	MSC0523S401T	8	70	30	100	
Medical Nutrition Therapy - I	MSC0523S402T	8	70	30	100	
Medical Nutrition Therapy - II	MSC0523S403T	8	70	30	100	
ELECTIVE COURSES (ANY TWO)						
Strategic management in healthcare	MSC0523S404T	5	70	30	100	
Yoga for prevention and promotion of health	MSC0523S405T	5	70	30	100	
Scientific writing	MSC0523S406T	5	70	30	100	
PRACTICAL/ABILITY ENHANCEMENT COURSE						
Practical & Viva	MSC0523S407P	6	140	60	200	
TOTAL	**06 (05 Theory Paper 01 Practical)**	**40**	**490**	**210**	**700**	

15. REVALUATION / SCRUTINY:

Revaluation of answer book(s) and security of the marks shall be permissible as per the policy of the university.

16. TEACHING HOURS:

Teaching hours shall be not less than 400 hours in every semester.

17. AWARD OF DEGREE:

The degree shall be awarded by the University only after receipt of Course completion certificate and NO dues from the Principal of the college.

18. LETTER GRADES AND GRADE POINTS

LETTER GRADE	GRADE	PERCENTAGE OF MARKS
O (Outstanding)	10	100 %
A+(Excellent)	9	90-99.99 %
A (Very Good)	8	80-89.99 %
B+(Good)	7	70-79.99 %
B (Above Average)	6	60-69.99 %
C(Average)	5	50-59.99 %
F(Fail)	0	0 Less than 50 %
Ab (Absent)	0	0 Absent

19. GRADES QUALIFYING FOR PASS:

Theory and Practical Examination

1. Minimum 5 Grade in the end of semester examination and **5 Grade** in continuous assessment evaluated by the department are required to pass **who fails to obtain 5 Grade shall be declared failed.**

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

3. Letter Grade **Ab (Absent)** will be showing the absent of the candidate in examination and will be required to reappear in the examination.

Continuous Assessment

Continuous assessments will be conducted two times in a semester. Continuous assessment will consist of departmental examinations, assignments, departmental posting, and evaluations. The objective is to allow students to have hands on experience. It would also help students to develop and formulate the data collection process and data analysis.

End of Semester Examination

a. Each theory paper examination shall be of 3 hours duration.

b. There will be Five theory papers in Each Semester.

20. CREDIT WEIGHTAGE DISTRIBUTION (%)

Item	Credit Weight (%)
1. Continuous Assessment	
Class participation/presentation, study records	10.00%
Assignment, quizzes and summer training report	10.00%
Departmental Postings, case studies, project reports	10.00%
2. End of Semester Exam	
70.00%	
Total	**100%**

21. AUTHORITY TO ISSUE TRANSCRIPT:

The Controller of Examination of the University shall be the authority for issuing transcript after receiving the described fee from the candidate.

22. WORKING HOURS/DAYS

Duration	**3 Years (6 Semesters)**
Working Days	6 Days in A Week
Working Hours	36 Hours in A Week

23. DISTRIBUTION OF COURSES SEMESTER-WISE

Semester	Core Course Component (CCC)	Elective Course Component (ECC)	Ability Enhance Component (AEC)/Practical	Total No. of Courses/Papers
Semester I	**3**	**2**	**1**	**6**
Semester II	**3**	**2**	**1**	**6**
Semester III	**3**	**2**	**1**	**6**
Semester IV	**3**	**2**	**1**	**6**
Total	**12**	**8**	**4**	**24**

24. DISTRIBUTION OF COURSES IN EACH SEMESTER

Sr. No.	Type of Course	Numbers
1	**Core Course**	**3**
2	**Elective Course**	**2**
Total	**5 (Five)**	

25. Types of Courses in M. Sc. Clinical Nutrition & Dietetics: -

1. Core Course-course designed under this category aim to cover the basics that a student is expected to imbibe in the discipline of M. Sc. Clinical Nutrition & Dietetics. A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

2. Elective Course-it is a course which can be chosen from a pool of courses it is specific or specialized or advanced or supportive to the discipline of M. Sc. Clinical Nutrition & Dietetics. Students have to **CHOOSE ANY TWO COURSE IN EACHSEMSTER** from the pool of course given to that semester.

3. **Ability Enhancement Courses (AEC) /Practical:** The Ability Enhancement (AE) Courses or practical are the courses based upon the content that leads to Knowledge enhancement. They are skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

Computation of SGPA and CGPA

The UGC recommends the following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

SGPA (Si) = $\sum(C_i \times G_i) / \sum C_i$

where C_i is the number of credits of the ith course and G_i is the grade point scored by the student in the ith course.

ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a program, i.e.

CGPA = $\sum(Ci \times Si) / \sum Ci$

where Si is the SGPA of the semester and Ci is the total number of credits in that semester.

iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration of Computation of SGPA and CGPA and Format for Transcripts

i. Computation of SGPA and CGPA
Illustration for **SGPA**

Course	**Credit**	**Grade letter**	**Grade point**	**Credit Point** (Credit x Grade
Course 1	3	A	8	3 X 8 = 24
Course 2	4	B+	7	4 X 7 = 28
Course 3	3	B	6	3 X 6 = 18
Course 4	3	O	10	3 X 10 = 30
Course 5	3	C	5	3 X 5 = 15
Course 6	4	B	6	4 X 6 = 24
	20			139

Thus, **SGPA =139/20 =6.95**

Illustration for **CGPA**

Semester 1	**Semester 2**	**Semester 3**	**Semester 4**
Credit : 20 SGPA:6.9	Credit : 22 SGPA:7.8	Credit : 25 SGPA: 5.6	Credit : 26 SGPA:6.0

Semester 5	**Semester 6**		

Credit : 26 SGPA:6.3	Credit : 25 SGPA: 8.0		

Thus, **CGPA =** 20 x 6.9 + 22 x 7.8 + 25 x 5.6 + 26 x 6.0 + 26 x 6.3 + 25 x 8.0

$$\frac{\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad}{} = \mathbf{6.73}$$

144

COURSE CONTENT

M.Sc. Clinical Nutrition & Dietetics Semester – I Examination

Name of the Program	MSC0523
Name of Course	Anatomy
Course Code	MSC0523S101T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Learn about cell, its structure & functions, types of tissues
CO 2	Learn about superior & inferior extremities of the body
CO 3	Get advancement in learning neuro anatomy & Histology
CO 4	Learn to demonstrate and explain various regions of human body

Course Content

General Anatomy

- Cell: Parts, Name of Cytoplasmic organelles and inclusion with their Functions.
- Epithelium: Types with examples and light microscopic structure.
- Connective Tissue: Classification with emphasis to tendon and ligament.
- Cartilage: Types with example.
- Bone: Types with example, types of Ossification (Stage of Ossification not required).
- Joints: Classification with example, emphasis to synovial joints.
- Muscles: Types (details of EM picture not required).
- Nervous tissue: Structure of a Neuron, Synapse Reflex arc, Degeneration and Regeneration of the Nerve, typical spinal nerve.
- Embryology (a) Ovum, Spermatozoa, fertilization and formation of germ layers and their derivations. (b) Development of skin, fascia, blood vessels, lymphatic. (c) Development of bones, axial and appendicular skeleton and muscles. (d) Neural tube, development of spinal cord, Brain stem and brain (cerebrum, cerebellum)

Regional Anatomy

Superior Extremity

- Pectoral region, Axilla, Brachial plexus, muscles of arm (front & back), muscles of forearm (front & back) palm (muscle, nerve, vessels) Synovial Bursae of hand and palmar spaces, nerves (axillary, median, ulnar, radial), Cutaneous distribution according to dermatomes, Related Clinical anatomy

- Joints: Shoulder girdle, shoulder, elbow, radial-ulnar, wrist, first carpo-metacarpal joints.

Inferior Extremity

- Front of thigh, femoral triangle, lumber plexus, lnguinal group of lymph Nodes, glutal region, back of thigh, leg (anterior, lateral, posterior compartments) foot (dorsum, plantar), Venous drainage of inferior Extremity, Nerve and their distribution (femoral, sciatic, tibial, common peroneal, obturator), Arches of foot, Cutaneous distribution according to dermatomes, Related clinical Anatomy.

- Joint, hip, knee, ankle, sub-talar & mid-tarsal joints.

Abdomen & Pelvis

- Abdominal wall, inguinal canal, Stomach, Liver, spleen, pancreas, kidney with ureter, small Intestine, Large Intestine, Abdominal Aorta, Portal vein, Diaphragm, Sacral plexus, posterior abdominal wall.

- Sacro-Iliac joint.

Thorax

- Thoracic wall, typical intercostals space, Mediastinum (boundaries, contents), Heart with its internal and external features, Blood vessels, Typical spinal Nerve, movement of ribs during Respiration, pleura, lungs.

Head & Neck

- Muscle of face, Cutaneous distribution of Trigeminal nerve, Triangles of neck (anterior & posterior) Sternocleidomastoid and Trapezius muscles, Muscle of mastication, Nasal cavity, Pharynx and Larynx (Parts, Sensory distribution).

- Joints: Temporo-mandibular Joint, Atlanto-occipital and Atlanto-Axial joints.

Neuroanatomy

- General Introduction and classification, Autonomic Nervous system

- Sympathetic and Para Sympathetic with their difference in distribution and function). Spinal cord, spinal Reflex, Pyramidal and extra-pyramidal tracts (Detail Nucleus not required), Blood supply; brainstem: gross features and blood supply; Cerebellum: gross features and functions; Cerebrum: gross features, functional areas, blood supply; Related clinical anatomy.

Cranial Nerves

- Names in order, Individual Cranial Nerve distribution, Idea about Upper Motor Neuron and Lower Motor Neuron, applied Anatomy.

Vertebral Column

- Identification of vertebrae of different regions, Intervertebral joints, Intervertebral disc, Muscles of vertebral column , Weight transmission, Applied anatomy, Radiological anatomy

Reference:

- Anatomy & Physiology for Nurses. E.C. Pearce, Jaypee brothers

Name of the Program	MSC0523
Name of Course	Physiology
Course Code	MSC0523S102T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Learn about human physiology at advanced level
CO 2	Learn about body fluids and their compositions
CO 3	Learn and understand various regions of human body system
CO 4	Learn about cardio-vascular system, respiratory system, reproductive system, excretory sysytem & endocrine system

Course Content

General Physiology

- Introduction and scope of Physiology
- Cell and tissue-Its structure, principal constituents, properties and functions including cell division.
- Body Fluid:

a) Blood: Composition and general functions of plasma. Blood cells – structure and function - Red Blood cells, white Blood Cells – including numbers and approximate length of life – position, structure and function of cells of Reticulo endothelial system.

b) Blood clotting including bleeding time and clotting time, factors accelerating or slowing the process. Blood groups and their significance, Rh-factor, Hemoglobin and E.S.R.

- Formation of Blood, tissue fluid and lymph.

Cardio-Vascular System.

(a) Structure and properties of Heart Muscles and nerve supply of Heart.

(b) Structure and functions of arteries, capillaries and veins.

(c) Cardiac cycle and Heart sound.

(d) Cardiac output measurements, factors affecting Heart Rate and its regulation.

(e) Cardio-vascular reflexes.

(f) Blood pressure, its regulation, physiological variation, peripheral resistance, Factors Controlling Blood Pressure, Hemorrhage.

(g) ECG study and stress test.

Respiratory System

(a) Mechanism of Respiration, Changes in diameter of thorax, Intra-pleural and Intra-pulmonary pressure.

(b) Quantities of lung volume, tidal and residual volume, vital capacity.

(c) Gaseous inter-changes in lung and tissues.

(d) Control of respiration-Nervous and chemical significance of changes in rate and depth, transportation of oxygen and carbon dioxide

(e) Respiratory states-anoxia, asphyxia, Cyanosis, Acclimatization.

6. Digestive System

(a) General arrangement of alimentary canal, liver, pancreas -position, structure and functions.

(b) Nutrition and Diet-carbohydrate, protein, fat, salts, water, vitamins and minerals digestion, absorption and Metabolism.

Reproductive System

α) Sex determination and development of puberty, male sex hormones, spermatogenesis, Female sex hormones, menstrual cycle. Ovulation, pregnancy, Function of placenta, lactation.

β) Excretory System Gross and minute structures of kidney, renal circulation, Mechanism of formation of urine, Glomerular filtration rate and tubular function, renal function and renal tests. Physiology of micturition.

Endocrine System

(a) Structure and function of pituitary (anterior & posterior). Thyroid, Parathyroid, adrenal cortex, adrenal medulla, Thymus and pancreas.

(b) Blood sugar regulation.

Skin-Structure and functions

Neuromuscular Physiology

1. Cell membrane – Ionic and Potential gradient and transport.
2. Muscle – Types of muscular tissue – Gross and Microscopic structure – function. Basis of muscle contraction – changes in muscle contraction, Electrical – Biphasic and mono-phasic action potentials, chemical, Thermal and physical changes, Isometric and Isotonic contraction.
3. Motor units and its properties – clonus, tetanus, all or none law, Fatigue.
4. Nerve – Gross and microscopic structure of nervous tissue, one neuron – Generation of action potential – Nerve impulse condition.
5. Neuromuscular junction.
6. Degeneration – Regeneration of peripheral nerves, electro tonus and Pfluger's law.
7. Types and properties of receptors, types of sensations, synapse, reflex arc, its properties - occlusion, summation, sub minimal fatigue etc.
8. Tracts – Ascending and descending and extra-pyramidal tracts.
9. Functions of E.E.G.
10. Functions of Cerebral cortex, cerebrum, cerebellum, Basal ganglia.
11. Thalamus – connection and functions.
12. Reticular formation – tone posture & equilibrium, Autonomic nervous system.
13. Special Senses Eye-Errors of refraction, equilibrium, Autonomic nervous system.
14. Speech and its disorders.
15. Ear and Vestibular apparatus, taste, olfactory, somatic sensations.

Reference:

- Anatomy & Physiology for Nurses. E.C. Pearce, Jaypee brothers

Name of the Program	MSC0523
Name of Course	Basics of Nutrition & Dietetics
Course Code	MSC0523S103T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Learn about basics of nutrition in terms of a well defined balanced diet
CO 2	Learn to assess person's daily requirements by using recommended dietary allowances
CO 3	Learn to deal with body composition methods and tools
CO 4	Learn to do nutritional assessment and planning a balanced diet for different age groups accordingly

Course Content

1. Dietary goals and guidelines
2. Macro & micro nutrients (Energy, Carbohydrate, Protein, Fat, Vitamins and mineral), water, fibre, antinutrients
3. Food pyramid, Healthy food plate, balanced diet
4. Food composition tables, apps, exchange list
5. Energy: Direct & Indirect caloriemetry, BMR, Specific dynamic action of food
6. Protein quality
7. Body composition

a) Significance and methods used for measurement of body composition in nutrition.
b) Application of body composition in nutrition

7. Growth & development
a) Cellular Growth and development during life cycle.
b) Gerontology
c) Prenatal & post natal development

8. Assessment of nutritional status of different age groups
- Infants, preschoolers, children, adolescents, adults & elderly
- Pregnant & lactating females

9. Planning diet for different age groups as per their nutrient requirements & factors affecting their nutritional needs
- Infants (Breastfeeding and complementary feeding) , preschoolers, children, adolescents, adults & elderly

- Pregnant & lactating females

Name of the Program	MSC0523
Name of Course	Healthcare services and its applications
Course Code	MSC0523S104T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Learn about concept and different dimensions of health and well being
CO 2	Learn about public healthcare services in India
CO 3	Understanding the standards set by different organization for improvising the quality in healthcare system
CO 4	Understand about several aspects of population health, prevalence of diseases and treatment

Course Content

1. **Health and Disease**

Concept, Definitions & Dimensions of health, Well being, Determinants of health, Evolution of medicine, Public Health, Health indicators, Health service philosophies, Disease & causation, Natural history of disease, Disease control & prevention, Changing patterns of disease.
Medical sociology– Introduction Sociological perspective of health, illness sand healing. Institutional perspective and Organizational perspective.

2. **Public and Private Health Care Services in India**

Evolution of public health systems in India (ancient, colonial & post-independence), Health Planning in India (Committees, Planning commission, Five year plans, National Health Policies), Public health systems in India (Center, State, District & Village level), Rural development, Corporate philosophy, Evolution and organization of private health systems in India and Current trends in private health care in India.

3. **WHO**- Objective, functions, UNICEF- objective and functions. Different Model of Healthcare- The Beveridge Model, The Bismarck Model, The National Health Insurance Model, The Out-of- Pocket Model. Brief Introduction of Health System of different countries: USA, UK, Canada, Australia, Sweden, and Germany.

4. **Population Health**

Introduction to population studies, Issues of Indian society & culture, Nuptiality & Fertility, Reproductive health, Population and Development (policies, programs & evaluation),

introduction to epidemiology (concept, terms, aims & uses), definition of epidemic, endemic, pandemic, sporadic. Prevalence and Incidence. Epidemiological methods- basic idea of Cohort study, Case Control study and RCT. Epidemiology of communicable diseases (TB, STDs, Diarrhoea & HIV/AIDS) and Epidemiology of Non communicable diseases (CHD, Cancer, Diabetes, Hypertension & Obesity).

5. **Contemporary Issues in Health Services Management**
   National Health Policy; Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A); National Vector Borne Disease Control Programme (NVBDCP)

Reference:

- Park K: 2005. *Text Book of Preventive and Social Medicine*.Banarsidas Bhanot Publishers: Jabalpur. 18th Ed.
- Beaglehole R & Bonita R. 1997. *Public Health atthe Cross roads: Achievements and Prospects*. Cambridge University Press: United Kingdom

Name of the Program	MSC0523
Name of Course	Computer Applications
Course Code	MSC0523S105T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Learn about basics of computer and its applications
CO 2	Understanding the basics of various computer operating systems
CO 3	Understanding the working of text formatting, creating, manipulating techniques in word processing
CO 4	Learn to use functions and formatting in spread sheet

Course Content

1. Computer

- Introduction & Objectives
- What is Computer? - Basic Applications of Computer
- Components of Computer System, Central Processing Unit, Keyboard, mouse and VDU, Other Input devices, Other Output devices, Computer Memory

- Concept of Hardware and Software- Hardware, Software, Application Software, Systems software
- Concept of computing, data and information
- Applications of IECT- e-governance, Entertainment
- Bringing computer to life- Connecting keyboard, mouse, monitor and printer to CPU, Checking power supply.

2. Operating Computer Using GUI Based Operating System

- Introduction & Objectives
- Basics of Operating System- Operating system, Basics of popular operating system (LINUX, WINDOWS)
- The User Interface- Task Bar, Icons, Menu, Running an Application
- Operating System Simple Setting- Changing System Date And Time, Changing Display Properties, To Add Or Remove A Windows Component, Changing Mouse Properties, Adding and removing Printers
- File and Directory Management- Creating and renaming of files and directories.

3. Understanding Word Processing

- Introduction & Objectives
- Word Processing Basics- Opening Word Processing Package, Menu Bar, Using The Help, Using The Icons Below Menu Bar
- Opening and closing Documents- Opening Documents, Save and Save as, Page Setup, Print Preview, Printing of Documents
- Text Creation and manipulation- Document Creation, Editing Text, Text Selection, Cut, Copy and Paste, Spell check, Thesaurus
- Formatting the Text - Font and Size selection, Alignment of Text, Paragraph Indenting, Bullets and Numbering, Changing case
- Table Manipulation- Draw Table, Changing cell width and height, Alignment of Text in cell, Delete / Insertion of row and column, Border and shading.

4. Using Spread Sheet

- Introduction & Objectives
- Elements of Electronic Spread Sheet- Opening of Spread Sheet, Addressing of Cells, Printing of Spread Sheet, Saving Workbooks

- Manipulation of Cells- Entering Text, Numbers and Dates, Creating Text, Number and Date Series, Editing Worksheet Data, Inserting and Deleting Rows, Column, Changing Cell Height and Width

- Formulas and Function - Using Formulas, Function

Name of the Program	MSC0523
Name of Course	Nutraceuticals & Functional Foods
Course Code	MSC0523S106T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Learn about structure and derivatives of neutraceuticals
CO 2	Learn about the uses, nutritional value and significant health effects of neutraceuticals
CO 3	Learn about interrelationships of various nutrients and health effects of some non nutritive food components

Course Content

1. Introduction of Nutraceuticals, their role in disease and recovery
2. Types of nutraceuticals available in the market
3. Organization of Nutraceuticals by molecular Structure
   - Isoprenoid derivatives
   - Olive oil as a functional food
   - Phenolic compounds
   - Carbohydrate and carbohydrate derivatives
   - Fatty acids and structural lipids
   - Amino acid and amino acid derivatives
   - Probiotics

4. Functional foods – Definition, types, sources
5. Non nutritive food components with potentials health effects – polyphenols, tannins, phytate, phytoestrogens, carcinogenic compounds, lectins and saponins.

Reference:

- Bamji, M.S., Rao, P.N. and Reddy, V. (Eds) (1996) : Textbook of Human Nutrition, Oxford & IBH Publishing Co. Pvt. Ltd.
- Robinson, C.H. and Lawler, M.R. (1986). Normal and Therapeutic Nutrition. Macmillan, New York

Name of the Program	MSC0523
Name of Course	Practical & Viva
Course Code	MSC0523S107P
Type of the Course	Practical
Credit per Semester	6
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Demonstrate and explain various regions of human body system
CO 2	Get advancement in learning and demonstrating specimens of superior and inferior extremities, abdomen, pelvis, thorax, brain
CO 3	Examine the body fluids, connective tissues and various organ systems
CO 4	Do calculations and assessment of nutritional status for all the age groups according to their requirements

Course Content

Superior Extremity: Demonstrations on skeleton/ lab specimens/ pictures of upper limb

- Osteology: clavical, scapula, humerus, radius, ulna, articulated hand, order of carpal bones, Surface anatomy

Inferior Extremity: Demonstration on skeleton/ lab specimens/ pictures of lower limb

- Osteology: Hip bone, femur, tibia, fibula, articulated foot (Identification of tarsal and major muscle attachments), Surface Anatomy
- Abdomen & pelvis : Abdominal viscera, Viscera of pelvis and blood vessels,
- Osteology: lumbar vertebrae, sacrum, bony pelvis
- Thorax: Demonstration on cadaver of thoracic wall, mediastinal structure, Heart, Lungs.
- Osteology: Sternum, Ribs (only general features), Thoracic Vertebrae (Identification, general features).

Head & Neck: Demonstration on skeleton/ lab specimens/ pictures of oral cavity, nasal cavity, pharynx, larynx, sagittal sections of head & neck, muscles of face and triangles of neck.

- Cranial bones (Identification of individual bone with general features), Base of skull : different foramina in relation to cranial nerves, Cranial fossa and their relation to brain and Hypophysis cerebri, , Cervical vertebrae.

Neuroanatomy: Demonstration on skeleton/ lab specimens/ pictures of gross specimens of spinal cord, brainstem, cerebellum, cerebrum and meninges, Identification of cranial nerves emerging from brain and brainstem

Hematology: RBC count, WBC count, differential count. ESR, Bleeding & Clotting time, Estimation of hemoglobin, Blood groups.

Human Physiology: Examination of (a) Respiratory system (b) heart and arterial pulse (c) deep and superficial reflexes (d) cranial nerves (e) motor system (f) sensory system including higher function (g) measurement of blood pressure

Basics of Nutrition & Dietetics

- Make a model/ poster/ chart/ ppt on dietary goals & guidelines given by NIN, ICMR
- Prepare a list of low & high food products for energy, protein, fat, calcium, iron, zinc, magnesium, copper, sodium, potassium, vitamin A, Beta carotene, vitamin D, vitamin C, Vitamin B12, folic acid, selenium
- Make a diagram of healthy food plate
- Planning diet & prepare a recipe for different age groups as per their nutrient requirements - Infants, preschoolers, children, adolescents, adults & elderly, pregnant & lactating females

M.Sc. Clinical Nutrition & Dietetics Semester – II Examination

Name of the Program	MSC0523
Name of Course	Advance Nutritional Biochemistry
Course Code	MSC0523S201T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70
Course Learning Outcomes: The student will be able to	
CO 1	Learn about biochemistry of various nutritional compounds along with their classification, structure & functions
CO 2	Learn about nature, types and disorders of acid and bases
CO 3	Learn to understand the function and role of enzymes and hormones in multiple reactions
CO 4	Learn and define the structure and functions of amino acids

Course Content

1. Introduction to Nutritional Biochemistry

2. Acid-Base balance, Buffers: definition, types of buffers, Role of lungs, kidneys and haemoglobin in Acid-Base balance Chloride shift, Disorders of Acid-Base imbalance

3. **Carbohydrates Chemistry:** Classification, structure and functions of carbohydrates, Properties of carbohydrates- Physical and chemical

Carbohydrate Metabolism Reactions of EMP, TCA (with structures), HMP, Gluconeogenesis (no structures), Glycogen metabolism (no structures), Homeostasis of blood glucose

4. **Protein Chemistry:** Classification, structure and functions of amino acids and protein
   Properties of Protein- Physical and Chemical
   Plasma proteins – Nature, properties and functions

Protein metabolism: General reactions of amino acids- transamination, deamination and decarboxylation, Detoxification of NH3, Krebs-Hensleit cycle, Creatinine and creatine synthesis

5. **Lipid Chemistry:** Classification, structures and functions of lipids, Properties of Lipids – Physical and Chemical Structure and functions of Cholesterol

Lipid Metabolism: Knoop's β-oxidation of even C fatty acid (no structures), ketone body, formation and utilization, Fatty acid biosynthesis of Palmitic acid (no structure), Metabolism of Cholesterol, Lipid storage disorders

6. Fate of minerals and vitamins in body

7. Water & electrolyte balance

8. Fibre – soluble/ insoluble/ digestible/ undigestible

9. Respiration & biological oxidation of food: Electron transport chain; O-R potential; oxidative phosphorylation; enzymes of biological oxidation; inhibition of respiratory chain and oxidative phosphorylation.
10. Hormones: Hormones produced by all endocrine glands and other organs of body like stomach, their role in human body, related diseases

11. Enzymes: Definition, classification, concept of active site, enzyme specificity, turnover number, Units, factors affecting enzyme activity, enzyme inhibition: Definition of Holoenzyme, Coenzyme, cofactor, Allosteric site, active site, prosthetic group, isoenzyme,

12. Nucleic acid: DNA, RNA – M RNA, T RNA, R RNA

Reference:

- Textbook of biochemistry by E.S. West, W.R. Todd, H.S. Nelson, T.T. Van Brugger, Oxford I.B.H. Publishing Co., New Delhi, Bombay, Calcutta.

- Lehninger, A.L. Biochemistry, Worth Publishing Inc. N.Y.

- Texbook of biochemistry for Medical Students by A.V.S. Rama Rao, L.K. & S. Publishers, Tanaku

Name of the Program	MSC0523
Name of Course	Advance Food Microbiology
Course Code	MSC0523S202T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Gain deeper knowledge of micro organisms in humans and environment
CO 2	Understand the importance of microorganisms in food spoilage and to learn advanced techniques used in food preservation.
CO 3	Understand the latest procedures adopted in various food operations to prevent food borne disorders and legal aspects involved in such cases.

Course Content

1. Introduction of Food Microbiology – Definition, concept, scope, history, basic terminology of food microbiology- relative humidity, water activity, pH of food
2. Types of micro organisms: their morphological characteristics, role and significance of micro organisms: Bacteria, Yeast, Mold
3. Cultivation of microorganism, sterilization and disinfection
4. Factors affecting growth of microbes in food: Intrinsic and extrinsic factor

5. **Food Spoilage and Food Borne Diseases**
    - Spoilage of different groups of food: Cereal and Cereal products, vegetables and fruits, meat and meat products, eggs and poultry, milk and milk products, canned foods.
    - Food borne infections and intoxications
    - Indicator organisms - their role and significance

6. **Food Contamination and Prevention from spoilage**

Sources and contamination- Air, water, soil, plants, animals and environment.

Principles and methods of food preservation –

- Physical methods-drying, freezing, heat treatment, irradiation, high pressure processing
- Chemical preservation and natural antimicrobial compounds.
- Biologically based preservation systems and probiotic bacteria

Reference:

- Frazier and Westhoff (2006) Food Microbiology by. Tata Mc. Graw Hill Publishing Company Ltd. New Delhi.
- Banwart (2004) Basic Food Microbiology CBS Publishers & Distributors New Delhi.
- Cappucino, James G (1999) Microbiology; A Laboratory Manual (VI Edition) Addison-Wesley Publishing Company.

Name of the Program	MSC0523
Name of Course	Food Science & Quality Control
Course Code	MSC0523S203T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Learn different techniques of food quality evaluation
CO 2	Learn about various outcomes and measures of food safety in food adulteration & food additives
CO 3	Become aware of the food quality determinants and their estimation methods
CO 4	Food quality standards and regulations of acts in India, food labeling and genetically modified crops

Course Content

1. Food quality evaluation techniques -
   a. Sensory evaluation – Colour, texture, flavour & taste, different tests & methods of sensory evaluation of foods
   b. Bacteriological & nutritional quality evaluation for food products
   c. Statistical methods used in quality control
2. Food adulteration - Definition, foods commonly adulterated, common adulterants. Harmful effects of adulterants. Methods for detection of some adulterants
3. Food safety: Basic concepts : food safety and importance of safe food, factors affecting food safety: physical hazard, biological hazard, chemical hazards in food. Naturally occuring toxins & antinutritional factors (lathyrism, Epidemic dropsy), contamination of food (Chemical, heavy metal & pesticide residue) fungal aflatoxic hepatitis, enteroergotism & mycotoxicosis.
4. Food Additives: Definition of food additives, classification of food additives. Functional role of different additives: antioxidants, preservatives, food colours, flavouring agents, emulsifying and stabilizing agents, anti-caking agents, sequestrants, buffering agents, anti foaming agents, sweetening agents and others. Safety issues

5. Food safety measures in a food service establishment. Street food safety measures. Hygiene requirements for licensing and safe health status of food handlers, personal hygiene and facilities to employees.
6. Food packaging: Introduction to Packaging : Concepts, Significance and Functions , Classification of Packaging Materials, Packaging Methods, Interactions between Packaging and Food – Toxicity Hazards , Labeling Requirements and Bar Coding, Nutrition Labeling and Nutrition Claims, Coding of Food Product , Packaging Laws and Regulation
7. HACCP-a Food safety assurance system: Introduction, need for HACCP, principles of HACCP, guidelines for application of HACCP principles. HACCP status in India.
8. Food Standard and quality control: Food standard and regulation in India. The prevention of food adulteration act, 1954-formulation and administration. Compulsory national legislations- Essential commodities act, 1955, Standard weight and measures act,1976, Export act 1963. Voluntary based product certification (BIS, AGMARK and Consumer protection act). Regulation related to genetically modified foods. International Organization and Agreements in the area of food standardization and quality control
9. Risk analysis: risk assessment, risk management, risk communication
10. FSSAI & its rules & regulations to maintain food quality & holistic wellness. Safe food practices as per FSSAI, nutrition labeling & carbon foot prints of food
11. Carbon footprints of food
12. Genetically modified and organic foods

Reference:

- Norman P.N. Food Science The AVI publishing co. 1962
- Srilakshmi B. Food Science 43. Charley H. Food Science John Wiley & Sons, 1982

Name of the Program	MSC0523
Name of Course	Molecular Nutrition
Course Code	MSC0523S204T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Learn about nutrition at molecular level
CO 2	Learn about nutrigenomics
CO 3	Learn about effect of xenobiotics
CO 4	Role of molecular nutrition in maintenance of normal health & in disease state

Course Content

1. The molecular nutrition paradigm
2. Nutritional physiology and biochemistry
3. Nutriepigenomics & metabolomics
4. Dietetics & molecular gastronomy
5. Molecular nutrients targeting with diet
6. Dietary supplements & nutraceuticals
7. Survey of target molecules
8. Survey of nutrient molecules
9. Targeting Foodome – Metabolome Interaction: a combined Modeling Approach
10. Metabolic syndrome in relation to different diseases
11. Solutions to implement Molecular Nutrition

Name of the Program	MSC0523
Name of Course	Healthcare Technology
Course Code	MSC0523S205T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Learn to know about applications of technology used in healthcare
CO 2	Learn about electronic health records and challenges in its implementation
CO 3	Learn how to manage health care through electronic means
CO 4	Learn about remote health care facilities and maintenance of health records

Course Content

1. Electronic Health records EHR
2. Definitions – contents and examples of EHR practices

3. Preliminary steps in implementation of HER
4. Issues and challenges in implementation of EHR
5. Planning for the introduction of EHR, Factors to be considered when developing EHR & implementation plan
6. Electronic Medical Record. Preliminary steps in implementation of EMR.
7. Remote healthcare and telemedicine, PHR (Patient Health Record), Clinical Decision Support System, m-Health, e-Health and other healthcare tools and applications.

Name of the Program	MSC0523
Name of Course	Total quality management in healthcare
Course Code	MSC0523S206T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Understand about the value & concept of quality managements in healthcare
CO 2	Learn about tools and techniques of total quality management
CO 3	Know about different quality improvement systems and hospital accreditation

Course Content

1. Quality
Definition, Value, concept of Quality, Dimensions of Quality.

2. Quality Management concepts
Definition, Objectives of Quality Management
Quality Gurus and their contribution – Juran, Deming, Ishikawa, Taguchi, Crosby
Quality management – Quality Planning, Quality Control, Quality Improvement

3. Statistical Quality Control
What is SQC, Difference with 100% Inspection
Statistical process Control – Control chart for variable (Xbar, R chart), Control chart for Attributes (p & c Chart), Process Capability, Six Sigma
Acceptance Sampling –Simple and Double sampling

4. Total Quality management
Definition, Principles of TQM, Quality Council Concept of Internal supplier & Internal Customer Kaizen, Quality Circle, Quality Improvement Teams, Seven basic QC Tools –check

sheet, Histogram, Scatter diagram, Process Mapping, Cause and Effect diagram, Pareto analysis, control charts, Cost of Quality, Bench Marking

5. Quality management System
Quality Manual
Introduction to National quality control guidelines 2013 for NRHM.
NABH, NABL, JCI, Quality Audit

6. Current trends in TQM
Quality in healthcare

Reference:

- Bester field H. Dale,Total Quality Management, Pearson New Delhi, 2005.
- Sridhar Bhat, Total Quality Management, Himalaya House publications, Mumbai, 2002SundaraRaju, S.M., Total Quality Management: A Primer, Tata McGrawHill, 1995.

Name of the Program	MSC0523
Name of Course	Practical & Viva
Course Code	MSC0523S207P
Type of the Course	Practical
Credit per Semester	6
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Understand the biochemical methods and approaches used in nutritional biochemistry
CO 2	Have an insight of sanitation and hygiene and its role in food production and storage.
CO 3	Understand and know various aspects of food quality in terms of microbes.
CO 4	Learn to isolate, maintain and identify microorganisms and know about characteristics of bacteria and fungi.

Course Content

1. Basic knowledge and working principles of Spectrophotometry and colorimetry, Chromatography: Paper, TLC, Column, Electrophoresis: Gel, Paper, Centrifugation & pH
2. Basic principles of reagent preparation in reference to normality, concentration and dilutions,
3. Preparation of solutions and reagents for the practical
4. Preparation of buffers and measurement of their pH with indicators and pH meter
5. Colours reactions for carbohydrates
6. Titremetric estimations - Estimation of calcium, Estimation of vitamin C

7. Estimation of Protein by Kjeldahl's Method in any food product, and in milk by aldehyde method
8. Estimation of Iron and glucose by colorimetric methods
9. Estimation of Saponification Number, Iodine Value, Free Fatty Acid
10. Paper chromatography
11. Preparation of sterilized media.
12. Isolation of pure culture and culture maintenance (Liquid Parafin).
13. Simple & Gram's staining
14. Determination of potability of water by MPN test.
15. Methylene blue reductase time test for checking microbial quality of milk.
16. Analysis of microbial count from air, water, soil by Standard Plate Count (SPC) technique.
17. Determination of indicator organisms in water & food on selected media (any two) E.coli, Shigella, S. aureus, Salmonella
18. Isolation and identification of microorganisms (fungi & bacteria)from spoiled food items.
19. Blotter's Test (a) Cereals- Wheat & Maize, (b) Pulses- Blackgram & Chick pea, (c) Others-Peanut/Coconut/Ginger/garlic/Turmeric
20. Production of fermented food using Pure Microbial Culture (Cap. Lactobacillus acidophilus, Tab. Sporolac)
21. Market survey report with power point presentation for RTE/ RTC foods
22. Food labeling – regulating agency, nutritional facts, Identify food colours, preservatives
23. Study of permitted range of various compounds – emulsifiers, acidity regulators, stabilizers
24. Food service facility visit
25. Practical learning of sensory evaluation of foods using different methods
26. Identifying food adulteration using different methods
27. Food product development: Definition, Product life cycle, Factors affecting development of a new product, The process of new product development, Future trends, Development of a new product – Perishable & Non perishable

M.Sc. Clinical Nutrition & Dietetics Semester – III Examination

Name of the Program	MSC0523
Name of Course	Human Nutritional Requirements
Course Code	MSC0523S301T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Understand the basis of human nutrient requirements and recommendations through life cycle
CO 2	Understand the factors affecting protein quality and methods of evaluating and improving the same.
CO 3	Learn about nature, types and properties of macro and micro nutrients

Course Content

1. **Energy-** Basis of requirement, factors affecting total energy requirement and recommendation through life cycle, Requirement techniques of measuring intake and expenditure.

2. **Protein-** Dietary protein (Food protein, meat protein, fish protein, milk protein, egg protein, wheat protein, Soy protein), Basis of requirement and recommendation through the life cycle, Methods of assessing protein quality, Critical overview of amino acid requirement and imbalance.

3. **Lipids-** Food sources, Cis vs trans fatty acids, Fat Substitutes in diet (non nuclear receptors), Health Implications and interpretation of lipoprotein cholesterol levels, Basis of requirement and recommendation through the life cycle.

4. **Carbohydrates-** Intake , Food Sources, Monosaccharides and disaccharides, Sugar and caloric sweeteners, Cereal Grains

5. **Dietary Fibers-** Fibers and Functional Fibers; Soluble and Insoluble Fibers, Dietary Fiber types and characteristics, Health Benefits of fiber and structural carbohydrates, Gastrointestinal fermentation and health, Satiety and reduced glycemic effect, Cholesterol binding and reduction of lipids, Fecal bulking, constipation and diverticulosis, Metal binding, Daily intake and recommendation

6. **Vitamins-** Requirement and recommendation through the life cycle, Fat soluble vitamins – A, D, E and K, Water-soluble vitamins - Ascorbic acid, Thiamine, Riboflavin, Niacin, Biotin, Pantothenic acid, Pyridoxin, Folic acid, Cyancobalamine and choline.

7. **Minerals-** Requirement and recommendation through the life cycle, Macro minerals: Calcium, Phosphorus, Magnesium, Sulphur, Sodium and Potassium, Micro minerals: Iron, Copper, Iodine, Zinc, Fluoride, Manganese and Selenium.

8. **Water-** Properties and body distribution of water, Sweat water and urinary water, Water Balance, Hydration while Exercising, Water Deficiency (dehydration) and Intoxication (edema)

Reference:

- Indian Council of Medical Research. Recommended Dietary Intakes for Indians – Latest Recommendations.
- Indian Council of Medical Research. Nutritive Value of Indian Foods – Latest Publication.

Name of the Program	MSC0523
Name of Course	Upcoming Trends in Human Nutrition
Course Code	MSC0523S302T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Assess nutritional needs in different physiological & environmental stress conditions
CO 2	Learn about nutrition considerations for astronauts
CO 3	Learn about nutritional considerations at different altitudes
CO 4	Learn about different types of diets in fashion

Course Content

1. Different types of diets in fashion
2. Nutritional needs in extreme environmental conditions
3. Disaster management (famine, drought, war)
4. Space nutrition
5. Fermented food products, Antioxidants
6. Immunonutrition – Role of specific nutrients in immune suppression and immune promotion
7. Prebiotics, probiotics & symbiotics, FODMAP
8. Organic foods and GM crops

Reference:

- Bamji, M.S., Rao, P.N. and Reddy, V. (Eds) (1996) : Textbook of Human Nutrition, Oxford & IBH Publishing Co. Pvt. Ltd.
- Robinson, C.H. and Lawler, M.R. (1986). Normal and Therapeutic Nutrition. Macmillan, New York
- Pike and Brown: Nutrition-An Integrated approach-John Wiley and sons, New York

Name of the Program	MSC0523
Name of Course	Public Health & Community Nutrition
Course Code	MSC0523S303T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Understand the concept and scope of community nutrition and associated public health problems
CO 2	Learn about public health care delivery system
CO 3	Understand about health problems due to undernutrition and overnutrition
CO 4	Learn about various nutrition education and food security programs and policies

Course Content

1. Concept & scope of community nutrition
2. Health care delivery system
3. Major nutrition related community health problems

A. Problems of undernutrition: PEM, anemia, iodine deficiency, vitamin A deficiency, scurvy, beri - beri, pellagra etc.

B. Problems of overnutrition: Fluorosis & Degenerative diseases - Obesity, diabetes, hypertension, cardiovascular diseases

4. Demography & epidemiology of various health indicators of Rajasthan & India
5. Identifying nutrition related problem of a community
6. Planning, intervention and monitoring of community nutrition programme
7. Community education : Audio aids, visual aids, audio visual aids, Barriers in communication, Traditional & Modern methods of community education, Quality attributes of a public health nutritionist
8. Nutrition Policies, Programmes and various agencies: National Nutrition Policy, Nutrition Programmes, ICDS, Nutrient Deficiency Control Programme, Supplementary Feeding Programmes, Food Security Programmes, Self Employment and Wage Employment Schemes, WHO, FAO, CARE, Red Cross, Unicef etc.

Reference:

- Text book of Human Nutrition. Bamji MS, Rao R.N. & Reddy V. Oxford & IBH Pub Co. PVT LTD, New Delhi
- Park J E and park K. 2009,Textbook of Preventive and Social Medicine; Edition: 20th, Jabalpur. Banarsidas Bhanot..
- Jelliffe and jelliffe 1989, Assessment of Nutritional Status in the Community.
- Gopalan C, Combating Undernutrition, Nutrition Foundation of India; Special Publication Series 3.

Name of the Program	MSC0523
Name of Course	Sports Nutrition
Course Code	MSC0523S304T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Understand the scope and importance of nutrition requirements in sport and exercise
CO 2	Understand basics of energy expenditure and intake before, during and after an exercise
CO 3	Leran about hormonal actions and adaptations due to types of exercise
CO 4	Understand the effects of different types of food products on muscle strength and atheletic performance

Course Content

1. Introduction to sport and exercise
2. Bioenergetics of Physical activity
3. Nutrition Exercise and Athletic Performance
4. Muscle and Exercise Basics (Muscle and Neuromuscular Junction, Muscle action potential, Sarcomeres and contraction , muscle fiber type, muscle adaption to strength training and endurance exercise muscle fiber type and endurance adaption)
5. Hormonal Adaption to Acute and Chronic Exercise (Catecholamines, Insulin and Glucagon, Cortisol, Growth Hormone and ACTH
6. Caffeine and Atheletic Performance
7. Muscle Carbohydrate Utilization
8. Maintaining Blood Glucose levels (During Exercise, cori cycle and alanine cycle)
9. Carbohydrate, Fat and Protein metabolism Before, during and after exercise

Reference:

- Nutrition in exercise and sports performance. Krause and Mahan's Food & The Nutrition Care Process

Name of the Program	MSC0523
Name of CourseNational Healthcare System	Legal and Medical Issues in Hospitals
Course Code	MSC0523S305T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	To acquaint the students with various legal aspects concerning type and character of the health care organizations and its duties towards patients and its employees
CO 2	To familiarize the students in matters of liability of hospital medical negligence and medical malpractice in diagnosis, administration of drugs, surgery
CO 3	Learn about legal aspects, acts and laws establishment in different types of hospitals.

Course Content

Unit-I: Law and establishment of hospitals-private/ public hospitals, legal requirements under medical council Acts. West Bengal Clinical Establishment Act and rules 2017 (as amended till date).

Unit-II: Essentials of contract Act. Contractual obligations in hospital services - requisites of a valid contract - hospital as ' bailer' - sale and purchase of" goods- duties towards patients - code of ethics-violation legal consequences.

Unit-III: Legal aspects relating to organ transplantation, MTP Act, 1971, Basics of Drugs and Cosmetic Acts, anesthesia. ESI Act, PNDT Act, AERB, ICMR Guideline of Scientific Research Members, clinical trials.

Unit-IV: Legal liability of hospitals - criminal, civil and tortuous; liability for negligence, consumer protection law, absolute liability and vicarious liability, legal remedies available to patients: remedies under contract law, tort, criminal law and consumer protection' Act. Medical Jurisprudence.

Unit-V: Medical ethics – basic issues, importance, process of developing and implementing ethics and values in an institution – codes of conduct: Hippocrates oath and declaration of

Geneva 2006 – NMC regulation – professional conduct, etiquette and ethics.

Reference:

- Anoop Kaushal K, Medical negligence and legal remedies, 3rdedition, universal law Publishcr.5.New Delhi, 2004.
- Avtar Singh, company law, 13th edition, Taxmann publishers, Lucknow, 2001.Consumer Protection Act1986
- Francis D., Government and Business, Himalaya publishing House, 1988

Name of the Program	MSC0523
Name of Course	Cognitive and Social Psychology
Course Code	MSC0523S306T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Learn to know about human behaviour and cognitive psychology
CO 2	Learn about various aspects of thought process and intelligence
CO 3	Understand about creativity & problem solving skills

Course Content

Unit-I: Approaches to the study of cognition and behaviour; Recent trends in Cognitive Psychology.

Unit-II: Attention and consciousness, perceptual processes, imagery, Visual and Auditory Recognition.

Unit-III: Cognitive development throughout life span; Theories of Intelligence, Artificial Intelligence; Intelligence and gender.

Unit-IV: Memory and brain process, Working Memory, Short term and Long-Term Memory, Memory Strategies and Meta-cognition, Mental Imagery and Cognitive Maps.

Unit-V: Knowledge representation, language Comprehension, Language Production and Bilingualism, language and culture; Language and intelligence.

Unit-VI: Creativity, stages in creativity, Intelligence and creativity; Problem Solving and Creativity, Deductive reasoning and Decision Making, Mental set and problem solving skills.

Unit-VII: Neuroscience measures (CT scans, PET scans, fMRI's) and evidence for cognitive theories.

References :

- Margaret.W. Matlin (2013). Cognition. 8th Edition ISBN 978-1-118-14896-9
- Ronald T. Kellogg. (2012). Fundamentals of Cognitive Psychology (2 ND Edition). Saint Louis University, USA.
- Robert J. Sternberg & Karin Sternberg (2016). Cognitive Psychology 7th Edition

Name of the Program	MSC0523
Name of Course	Practical & Viva
Course Code	MSC0523S307P
Type of the Course	Practical
Credit per Semester	6
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Make the students understand various methods for estimating energy and protein requirements of an individual
CO 2	Prepare them to plan studies to find out Nutrient balance
CO 3	Identify and calculate nutrients in different stages of life
CO 4	Identify deiciency signs & symptoms, and to planning a days diet

Course Content

- Estimation of Energy Requirements- BMR
- Energy expenditure on physical activities
- Estimation of Protein requirements- Factorial Approach
- Estimation of Protein Quality using NDP-Cal%
- Balance Studies -Nitrogen Balance
- Determine total fat and fibre intake of self using data on dietary intake using 24 hrs dietary recall method for a period of 3 days fat (MUFA, PUFA AND SATURATED FAT)
- Planning diet for different conditions studied in theory like -

- Weight management programmes
- Disaster diet management plan
- Space nutrition diet plan

- Market survey for supplements for sports nutrition with their comparative analysis
- Presentations based on traditional & modern developments in : Fermented foods, Antioxidants, Market survey and comparative analysis of Nutraceuticals and Functional foods, Organic foods**,** Prebiotics, probiotics & symbiotics.
- Visit to a health care delivery system/ nutrition program centre

- Making low cost price list
- Identifying deficiency signs of community health problems – PEM, IDD, IDA, vitamin A
- Plan & prepare low cost recipes for PEM, IDD, IDA, vitamin A, pregnancy, lactation
- Plan a days diet for infant & prepare low cost premixes
- Prepare an audio visual aid for community education

Reference:

- Jelliffe and jelliffe 1989, Assessment of Nutritional Status in the Community.
- Indian Council of Medical Research. Recommended Dietary Intakes for Indians – Latest Recommendations.
- Indian Council of Medical Research. Nutritive Value of Indian Foods – Latest Publication.

M.Sc. Clinical Nutrition & Dietetics Semester – IV Examination

Name of the Program	MSC0523
Name of Course	Biostatistics & Research Methodology
Course Code	MSC0523S401T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Understand scope and need of research methodology and statistical approaches to the problems
CO 2	Know the significance of research methodology in Home Science.
CO 3	Understand the types, tools and methods of research and develop the ability to construct data gathering instruments appropriate to the research design
CO 4	Apply statistical techniques to research data for analyzing and interpreting data carefully.

Course Content

1. Meaning & scope of statistics
2. Presentation of data – tabulation, graphic & diagrammatic presentation by graphs, bars, charts etc.
3. Measures of central tendency – mean, mode, median
4. Measures of dispersion – mean deviation, standard deviation, variance, range, skewness, kwctosis
5. Correlation & regression interpretation
6. Ideas of probability

7. Hypothesis – null hypothesis – level of significance
8. Sampling techniques
9. Student's t test – its application, significance, confidence interval in normal population for mean when variance is known & unknown
10. Design of experiments – Analysis of variance, completely randomized & random block designs
11. Non parametric inference: Sign, Median, Run test & X test, (as goodness of fit & independence of attributes in 2x2 & r x c contingency tables).
12. Research design and scientific writing – Experimental & Descriptive, definition & identification of Research problem, selection of problem, basic assumption & limitation of problem.
13. Data gathering instruments – Questionnaires, interviews, measurements & scales, reliability & validity of measuring instruments
14. Methods of collecting information – Census & sampling, various sampling schemes, Methods of estimating population means, & its standard error in simple random sampling & stratified random sampling
15. Planning, executing & analysis of large scale surveys with special emphasis on surveys in Nutrition. Presentation & preparation of report for publication

Reference:

- Kothari, C.R. (Second Edition): Research Methodology- Methods and Techniques, Wishwa Publication, New Delhi.

Name of the Program	MSC0523
Name of Course	Medical Nutrition Therapy - I
Course Code	MSC0523S402T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Understand factors affecting patient care in different physiological conditions
CO 2	Understand the underlying changes during diseases.
CO 3	Understand the role of diet in the management of various diseases Enabling them to understand nutrition management in infection, stress, allergies and special conditions
CO 4	Enabling them to understand nutrition management in cardio-vascular, GI disorders, diabetes, pulmonary disorders

Course Content

1. Factors in patient care, counseling and co-ordinated nutritional services for the patient, feeding the patient, psychological aspects
2. Assessment of patient's needs – Different nutritional assessment tools for patients (MUST, SGA, MNA etc)
3. Documentation – SOAP, ADIME
4. Physiological changes & diet for different types of infections (Fevers – TB, Typhoid & HIV)
5. Medical nutrition therapy in GI disorders
6. Medical nutrition therapy in Cardiac disorders
7. Medical nutrition therapy in diabetes
8. Medical nutrition therapy in allergies
9. Medical nutrition therapy in hypertension
10. Medical nutrition therapy in pulmonary disorders

Reference:

- Normal & Therapeutic nutrition. Robinson CH, Lawler MR, Chenoweth WL and Garwick AW (1986) 17th Ed. Macmillan Publishing Company, NewYork,, Collier Macmillan Canada, Inc. Toronto, Collier Macmillan publishers, London.
- Therapeutic nutrition. B. Srilakshmi
- Swaminathan, M.S. (1985). Advanced Textbook on Food and Nutrition. Vol. I & II. The Bangalore Printing & Publishing Co. Ltd. Bangalore.
- Robinson, C.H. and Lawler, M.R. (1986). Normal and Therapeutic Nutrition. Macmillan, New York.

Name of the Program	MSC0523
Name of Course	Medical Nutrition Therapy - II
Course Code	MSC0523S403T
Type of the Course	Core
Credit per Semester	8
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Understand factors affecting patient care in different physiological conditions
CO 2	Understand the underlying changes during diseases.
CO 3	Enabling them to understand nutrition management in kidney disorders, liver disorders, neurological disorders, cancers, burns and pre & post surgery
CO 4	Enabling them to understand standard guidelines for nutrition management

Course Content

1. Medical nutrition therapy in kidney disorders
2. Medical nutrition therapy in liver disorders
3. Medical nutrition therapy in neurological disorders
4. Medical nutrition therapy in cancer
5. Medical nutrition therapy in burn
6. Medical nutrition therapy in pre & post surgery patients including bariatrics
7. Medical nutrition therapy in autoimmune disorders
8. Special feeding methods - Enteral & parentral feeding, critical care nutrition
9. Drug nutrient interaction
10. Standard guidelines for clinical nutrition (ASPEN/ ESPEN/ IAP/ KDQOI etc.)

Reference:

- Normal & Therapeutic nutrition. Robinson CH, Lawler MR, Chenoweth WL and Garwick AW (1986) 17th Ed. Macmillan Publihing Company, Newyork,, Collier Macmillan Canada, Inc. Toronto, Collier Macmillan publishers, London.
- Therapeutic nutrition. B.Srilakshmi
- Swaminathan, M.S. (1985). Advanced Textbook on Food and Nutrition. Vol. I & II. The Bangalore Printing & Publishing Co. Ltd. Bangalore.
- Robinson, C.H. and Lawler, M.R. (1986). Normal and Therapeutic Nutrition. Macmillan, New York.

Name of the Program	MSC0523
Name of Course	Strategic management in healthcare
Course Code	MSC0523S404T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	This subject will integrate all management concepts to look at the organization from both long and short term point of view
CO 2	Learn about organizational analysis, planning and formulation of strategies
CO 3	Understand strategic levels, plans and policies in marketing

Course Content

Unit I: Introduction to strategic management

Organizational mission: Philosophy, policy, Strategic Intent, vision, mission, values.
Defining Strategy, Strategic management process, Strategic objectives, Porter's value chain: concept and applications

Unit II: SWOT analysis
Industry characteristics analysis- PEST analysis, Porter's five force
Organizational analysis- Capability factors: Financial, Marketing, Operational, Personnel, General Management

Unit III: Level of strategy
Corporate Level Strategy- Grand Strategy, Portfolio analysis:
BCG Matrix, Business level Strategy, Generic Business Strategy
Functional strategy analysis- Plans and policies:
Financial, Marketing, Operational, Personnel, Information Technology and Integration

Unit IV:
Strategic Evaluation - Brief concept of Bench marking and Balance Score card.
Control of strategies- strategic diagnosis, operational diagnosis.
CSR- Management and society, culture and management, management ethics, social objectives and responsibilities of management, corporate social responsibility-hospitals and social responsibility.

References:

- Oster Sharon M. Strategic Management for non profit organizations, Oxford publishers,. NewDelhi.
- Lawrence R. Jauch and W F Glueck, Business Policy and strategic management, 6thedition, Frank brothers, New Delhi, 2003.
- Srivastava; Management Policy and Strategic Management; Himalaya Publications, Mumbai. .Allio, Robert J; The practical Strategist- Business and corporate strategy for 1990s, Indus publications, 1994.
- Kazhmi, Business Policy and strategic management, Tata Mc Graw Hill, New Delhi, 2002.

Name of the Program	MSC0523
Name of Course	Yoga for prevention and promotion of health
Course Code	MSC0523S405T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70
Course Learning Outcomes: The student will be able to	
CO 1	Understand practical implications of yoga in disease prevention and treatment
CO 2	to understand which practices of Yoga are good and which need to be avoided in particular situations
CO 3	To understand the underlying mechanisms of such yoga practices

Course Content

Unit -1: Introduction

(Talk with PPT: Students should be asked to correlate their experiences of practical to find out how they are improving their stamina and eye sight . Students having sight problems should be encouraged to follow the procedure to correct their refractive error. Students should be encouraged to watch the video made by MGUMST on these topics)

Importance of prevention of health problems and promotion of positive health. Identification of different systems of body to strengthen to prevent personality hazards and to promote positive personality.

• Yoga for Stamina building Introduction, Body systems in improving physical stamina, Physiology of muscle action, Physical stamina according to yoga, Yoga practices for physical stamina development.

• Yoga for Eye Sight improvement Introduction, Structure and function of eye, problems of eye where Yoga can help, Yoga for refractive errors, Eye problems and their yogic solution, Eye sight improvement and the total insight, Yoga practices for eye sight improvement.

Unit – 2:

• Yoga for IQ Development Introduction, Intelligence and Intelligence quotient (IQ), Concept of Development of intelligence according to Yoga, Concept of Intelligence quotient and Intelligence according to Yoga, Development of Intelligence, Using intelligence in the right direction for the growth, Yoga practices for IQ development.

• Yoga for Voice Culture

Introduction, Anatomy and Physiology of the vocal system, Causes of injury to the vocal system, vocal disorders and voice disorders, Voice culturing, developing musical talents, Voice culture for developing oration, Yoga practices for voice culture.

Unit –3:

Pedagogy -Talk with PPT: Students should be asked to correlate their experiences of practical to find out how they are improving their Relaxation levels and creativity. Students having stress/lacking creativity problems should be encouraged to follow the procedure and correct. Students should be encouraged to watch the video made by MGUMST on these topics. Stress scores can be measured at the beginning and end of the semester.

• Yoga for Stress Management Introduction, Understanding stress, Physiological changes due to stress, Stress management, Yoga practices for stress management.

• Yoga for Creativity Development Creativity and intelligence, silence the source of creativity, Creativity development – Yogic approach, Layers of silence and the siddis, How to use the sidhis? , Yoga practices for creativity development.

Unit – 4:

Pedagogy - Talk with PPT: Students should be asked to correlate their experiences of practical to find out how they are improving their Relaxation levels and creativity. Students having stress/lacking creativity problems should be encouraged to follow the procedure and correct. Students should be encouraged to watch the video made by MGUMST on these topics. Students can be asked to mark their anger levels on an analogue scale at the beginning and end of the semester. Students can be asked to mark their Ego levels on an analogue scale at the beginning and end of the semester.

• Yoga for Anger Management

Introduction, steps in anger management, bodily reactions with anger, Yoga for anger management - a move from limbic brain to cerebral cortex, how yoga works for anger management, Yoga practices for anger management.

• Yoga for Ego and Greed Management

Introduction, psychologists view about ego, Ego according to Yoga, Culturing of ego for building social harmony, the right direction, Yoga practices for Ego and Greed management.

Unit – 5:

Pedagogy - Talk with PPT: Students should be asked to correlate their experiences of practical to find out how they are improving their Relaxation levels and creativity. Students having less memory/lacking concentration problems should be encouraged to follow the procedure and correct. Memory and concentration levels of all the students can be measured at the beginning and end of the semester. Students should be encouraged to watch the video made by MGUMST on these topics. Stress scores can be measured at the beginning and end of the semester.

• Yoga for Memory Development What is memory? Which memories to be maintained? Memory development not merely memory enhancement; Antarindriyas; Patanjalis def of smriti (memory), Types of memory, Improving Good memories, erasing memories about calamities, Problems /diseases related memory

• Yoga for concentration development Ekagrata(concentration) Vs Chanchalata (randomness), role of concentration in day to day activity, neural correlates of concentration, problems of concentration, yoga for improvement of concentration and Yoga for removing problems of concentrations.

References:

1. Sampoorna Yoga videos - SVYP

2. Sampoorna Yoga Lecture notes.

Name of the Program	MSC0523
Name of Course	Scientific writing
Course Code	MSC0523S406T
Type of the Course	Elective
Credit per Semester	5
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	To develop and improve the scientific and technical writing skills
CO 2	To enable to produce clear and effective scientific documents
CO 3	To enhance the level of technical communication and practices

Course Content

1. Key elements of scientific writing

Quality information, Nature of language, Structure

Characteristics of scientific writing- Clear and precise use of language, Accessibility to the intended audience, Correct information, Logical sequencing of information, Use of correct grammar, Appropriate use of technical terms, illustrations or diagrams

2. Drafting a scientific document

Research the document, Gather information, Plan the format, Create an outline, Write first draft, Check the accuracy, Revise and amend the document

Type of academic journal articles- Letters/communications, Research notes, Articles, Supplemental articles, Review articles

3. Writing effective scientific documents

Reports (Research/Progress), Scientific paper (Journal/Conference), Review paper, Abstracts, Theses, Electronic/Web based document

Elements of scientific documents- Sections/subsections, Headings/subheadings, Front matter (Title, Title page, Abstract, Table of contents, List of figures, List of tables, List of terms, Acknowledgement), Body (Introduction, Review of literature, Methodology, Results, Discussions, Summary, Conclusion, Recommendations), End Matter (References, Appendices, Indices)

4. Ethics and scientific publication

Permission, Data fabrication and falsification, Plagiarism, Redundant and duplicate publication, Conflict of interest, Authorship issues, Animal and human welfare concerns, Reviewer responsibility

Oral Presentation- Format of oral presentation (Informal/formal), Visual aids (LCD projector, overhead projector OHP and transparencies or other display media), Delivery (Voice projection, Body language, Spoken v. written language, Notes, Time limit).

5. Writing a project proposal for grants

Rationale and importance of research, Empirical and Theoretical conceptualization, Presenting pilot study/ data, Research proposal and time frame, Clarity and specificity of method, Clear organization, Outcome of research and its implications, Budgeting, Available infrastructure and resources, Executive summary

Reference:

- Robert A. Day. How to Write and Publish a Scientific Paper, 5th edition, Oryx Press, Phoenix, 1998.
- Martha Davis. Scientific Papers and Presentations. Academic Press. 1997
- Michael Alley. The Craft of Scientific Writing, 3rd edition, Prentice Hall, Inc., 1996.
- Janice R. Matthews, John M. Bowen, Robert W. Matthews. Successful Scientific Writing: A Step-By-step Guide for the Biological and Medical Sciences, University Press, 2000.
- Peter J. Gosling. Scientist's Guide to Poster Presentations, Kluwer academic/Plenum publishers, 1999
- Edward Barrett, Leslie Perelman. The Mayfield Handbook of Technical and Scientific Writing, McGraw-Hill, 1997.

Name of the Program	MSC0523
Name of Course	Practical & Viva- voce
Course Code	MSC0523S407P
	Practical
Credit per Semester	6
Hours per Semester	70

Course Learning Outcomes: The student will be able to	
CO 1	Understand the types, tools and methods of research and develop the ability to construct data gathering instruments appropriate to the research design
CO 2	Understand the role of statistics and computer applications in research
CO 3	Apply statistical techniques to research data for analyzing and interpreting data carefully
CO 4	Understand planning, preparation and service of therapeutic diets for various diseases

Course Content

1. Frequency distribution, histogram, frequency polygons, ogive.
2. Measures of Central Tendency, Measures of Variation.
3. Coefficient of correlation, Regression and prediction.
4. Chi-square tests- Goodness of fit, Independence of Attributes 2x2 and rxc contingency tables.

5. Application of Student's t-test for small samples- test of significance of single mean, difference in means, independent and paired T test
6. F-test for two sample variances.
7. Analysis of Variance- one-way classification ,two-way classification with and without replication
8. Basics of SPSS

CLINICAL POSTING

A clinical posting will be conducted and students will submit clinical posting report also before commencement of theory examinations. A case study shall be presented in practical examination.

DISSERTATION

It will be a research project based on case studies/ intervention trials/ cross sectional or longitudinal observational studies/ making nutrition related guidelines/ standardization/ product development etc.

Pedagogy

Identifying several situations same and able to dissertation work, writing a proposal and making a presentation to the Dissertation faculty advisory committee. Reporting to the committee on the progress of research work periodically. Making use of a variety of research methods. Defending the inference before the Examining Committee.

Contents

Every student will do a detailed study on the topic selected for the dissertation, and is expected to prepare a two or three proposals which he intends to take up for the Dissertation. Faculty will examine this and decide on the topic of dissertation.

The Process involves:

1. Formulation of objectives and hypothesis
2. Review of literature
3. Designing the tool for data collection
4. Data collection
5. Coding, classifying and analysis of data
6. Inferences, conclusions and recommendations
7. Preparing a bibliography
8. Writing the dissertation and submission

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester I

Code MSC0523S101T

First Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - I

ANATOMY

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

α) Classify joints with the help of suitable examples with special emphasis on synovial variety

β) Describe hip joint, explain its type, articular surface and its ligaments.

χ) Describe cranial nerves in detail, cla3ssify the names and distribution in individual.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Describe alimentary tract of human body.

b) What is the anatomy of liver

c) Write about muscle and its types.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Anatomy of eye.

b) Describe about structure of cell

c) Explain about structure of liver.

d) Abdominal Aorta

e) Make diagram of ear.

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester I

Code MSC0523S102T

First Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - II

PHYSIOLOGY

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

α) Explain physiology of circulatory system

β) Describe cardiac cycle and add a short note on cardiac output

χ) Describe cranial nerves in detail, classify the names and distribution in individual.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) What is the physiology of respiratory system

b) Describe digestion of protein in human body

c) Write about muscle and its types.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Functions of salivary glands

b) Blood Pressure

c) Explain about physiology of liver.

d) Write about functions of pancreas

e) What is portal blood flow mechanism

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester I

Code MSC0523S103T

First Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - III

BASICS OF NUTRITION & DIETETICS

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) What are the factors affecting nutritional needs of pregnant female, plan a day's diet for her.
b) Define Infant meal plan with factors affecting meal plan
c) What is the significance of protein quality, describe the methods used for evaluation of protein quality

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Explain factors affecting BMR
b) What is body composition ?
c) Describe prenatal & post natal development

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) What is phenylketone urea?
b) Dietary survey methods
c) Stages of growth and development.
d) Factors affecting energy requirements of infants
e) Indian Food Composition Tables

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester I

Code MSC0523S104T

First Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - IV

HEALTHCARE SERVICES AND ITS APPLICATION

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. **No. 1. Long Answer (Attempt any 2)** **2 x 15 = 30**

α) Enumerate the steps involved in administration of care plan. Explain the risk factors of hospital acquired infections and how it can be controlled?

β) Suppose a person has met with an accident. What kind of services of priority should be followed by the first aider in an emergency?

χ) Public and Private health services have evolved over last six decades and have had an impact on saving lives of innumerable population in our country? Explain this statement with relevant facts and figures

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Write a detailed note on World Health Organization.

b) What is the concept, definition and dimension of wellbeing?

c) Write short notes on – National Health Policies-Public Health Systems-Current trends in private healthcare.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Write about national oral health program

b) Briefly explain healthcare models

c) Describe the epidemiology of any non-communicable diseases

d) Illustrate the glimpses of NHP-2017

e) Write about the changing pattern of diseases for 1000 years.

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester I

Code MSC0523S105T

First Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - V

COMPUTER APPLICATIONS

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q.No. 1. Long Answer (Attempt any two) **2X15 = 30**

α) Discuss about Memory.
β) Discuss about input / Output Devices.
χ) What do you understand about Magnetic ink character recognition (MICR)?

Q. No. 2. Short Essay (Attempt any Two) **2X10 = 20**

α) Optical mark recognition (OMR)
β) Bar code reader
χ) Computer software

Q.No. 3. Short notes (Any four) **4X5 = 20**

α) Monitor
β) Word processing software
χ) Definition of Machine language
δ) Compiler & Interpreter
ε) Interpreter

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester I

Code MSC0523S106T

First Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - VI

NUTRACEUTICALS & FUNCTIONAL FOODS

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Describe nutritional interrelationship, write about concepts of nutritional relationship between protein, energy, carbohydrates and fats

b) Describe neutraceuticals and differentiate them by their molecular structure and derivatives

c) Describe in detail any five non nutritive food components with potential health effects.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Write about mechanism of health claims and give food sources

b) Describe consequences of nutrient adaptation on low intake of energy, protein and iron

c) Write in detail about carbohydrate and their derivatives

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) What are probiotics and prebiotics

b) Write about phytoestrogens and phytates

c) What are non nutritional factors of food

d) Define effect of macronutrient on micronutrient requirements

e) What are functional foods

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester II

Code MSC0523S201T

Second Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper I

ADVANCE NUTRITIONAL BIOCHEMISTRY

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Explain glycolysis with diagram.
b) Explain major & minor nutrients in our diet with their sources & functions.
c) Describe lipid metabolism and give in details about lipid storage disorders

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Types of fatty acids
b) Explain physical & chemical properties of fat.
c) Who invented double helicle structure of DNA & express it in labeled diagram

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Sources of vitamin B12
b) Functions of protein
c) Importance of dietary fibre
d) PUFA
e) Essential amino acids

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester II

Code MSC0523S202T

Second Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - II

ADVANCE FOOD MICROBIOLOGY

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Explain food safety system of India.
b) Explain with diagram different types of bacteria.
c) Describe the factors responsible for growth of micro organisms.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Explain food borne toxicity.
b) Explain about different types of microorganisms.
c) Explain microbiological water testing methods.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Explain food borne infections.
b) Bacteria responsible for spoilage of milk.
c) How micro organisms are cultivated ?
d) What are quality control organizations in our country ?
e) Explain different types of molds.

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester II

Code MSC0523S203T

Second Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - III

FOOD SCIENCE & QUALITY CONTROL

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) What is FSSAI & describe about other food quality regulating agencies
b) Explain about HACCP
c) Describe naturally occurring toxins in detail and presence of anti-nutritional factors in different foods

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Describe food packaging methods
b) Which are permissible food colors & preservatives ?
c) Write difference between adulteration and contamination, give any 2 methods for detection of adulterant.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Carbon foot prints of food
b) Permissible preservatives and additives in foods
c) Explain about different types of food toxins
d) FSSAI guidelines for hygiene to get a food license
e) What common adulterant is found in turmeric?

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester II

Code MSC0523S204T

Second Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - IV

MOLECULAR NUTRITION

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) What are xenobiotics? How these affect human body?
b) Describe Nutrigenomics in detail.
c) What is Fooddome metabolome?

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Describe epigenetics in detail.
b) What metabolic changes occur in human body in condition of cancer?
c) What is calcium hemostasis in heart disease?

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) How vitamin D affects calcium absorption in human body?
b) What metabolic changes occur in kidney disease?
c) What is RNA & describe types of RNAs.
d) What is the concept & scope of molecular nutrition?
e) How body metabolism is affected in diabetes?

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester II

Code MSC0523S205T

Second Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - V

HEALTHCARE TECHNOLOGY

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Emerging technology issues in healthcare.
b) Concepts and operation of the main components of word processor.
c) Electronic spreadsheet

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Conceptual and relational data modeling
b) Data integrity
c) Relational normalization theory

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Database systems
b) Health Statistics
c) Billing softwares
d) Models of health care delivery.
e) Presentation software programs.

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester II

Code MSC0523S206T

Second Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - VI

TOTAL QUALITY MANAGEMENT IN HEALTHCARE

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) What is TQM? What are the principles of Total Quality Management? What are the obstacles in implementing TQM?
b) Quality Guru Juran's steps of Quality improvement
c) Use of Statistical Quality Control techniques in monitoring and maintaining of the quality of products and services.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Discuss the key steps to implement outcome management to improve the status of the patient.
b) Explain the process and benefit of certifications and accreditations in Hospitals.
c) DEscribe in detail about the Types of Audit conducted in Hospitals

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Explain Cause and Effect Diagram
b) Flow diagrams
c) Accreditation in Hospitals
d) Business process reengineering (BPR)
e) Determinants of quality

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester III

Code MSC0523S301T

Third Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - I

HUMAN NUTRITIONAL REQUIREMENTS

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Write on critical overview of amino acid requirement and imbalance.
b) How iron requirements were dervied for a pregnant woman?
c) Describe different methods to assess energy expenditure.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Name techniques for assessment of energy requirements
b) Explain about SDA
c) How to calculate RDA for energy for infants

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) What are RDAs
b) What are EAR ?
c) Write short note on TUL.
d) Describe briefly obligatory nitrogen losses
e) What is factorial method?

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester III

Code MSC0523S302T

Third Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - II

UPCOMING TRENDS IN HUMAN NUTRITION

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Write factors affecting diet plan for stress condition

b) How will you manage your food resources during a disaster that can fulfil maxium needs of affected population in minimum resources?

c) Define BMI and describe body composition & its elements in detail.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Explain different types of fad diets.

b) Explain space nutrition.

c) Write factors affecting nutrient needs for weight management.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) What are antioxidants?

b) Define Probiotics

c) What is nutrigenomics?

d) Plan a diet for famine condition

e) Define space nutrition

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester III

Code MSC0523S303T

Third Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - III

PUBLIC HEALTH & COMMUNITY NUTRITION

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Describe about education methods in a community
b) Explain about ICDS
c) Define problems due overnutrition & undernutrition. Describe any 3 problems due to overnutrition in detail.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Describe Health & nutrition related agencies in India
b) Describe in detail major nutritional problems in community
c) Writes steps of a community nutrition programme.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Barriers in communication
b) Anemia
c) Name National public health programme
d) UNICEF
e) What is PDS?

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester III

Code MSC0523S304T

Third Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - IV

SPORTS NUTRITION

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Explain in detail difference between sports nutrition and nutrition for exercise
b) Describe about bioenergetics for physical activity
c) What is the different between medical nutrition therapy for endurance sports and strength sports?

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Describe in detail about pre event and post event meals
b) Describe the effect of caffeine on sports performance.
c) Role of hormones in exercise.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) How muscles use carbohydrates during exercise.
b) What is the process of blood glucose maintenance during exercise?
c) Describe carbohydrate, protein & fat metabolism before exercise.
d) Describe muscle fibre.
e) What is ACTH & how it works during exercise?

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester III

Code MSC0523S305T

Third Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - V

LEGAL & MEDICAL ISSUES IN HOSPITAL

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) What are the laws with regard to the establishment of private / public hospitals? What are the legal requirements under Medical Establishment Act?

b) What are the essentials of contract act? What are the contractual obligations in hospital services? Explain

c) Explain the rule governing Prohibition of Violence against medical personnel and damage to property?

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) What are the legal liabilities of a hospital under the consumer protection law? What are the legal remedies available to the patient under consumer law?

b) Explain in detail what are medical ethics? What are the basic issues and the importance of developing medical ethics?

c) Provisions for registered practitioners under Medical Termination of Pregnancy Act

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Drugs and Cosmetics Act

b) Hippocratic Oath

c) Ethical guidelines for Bio-medical research

d) Medical Negligence

e) Legalities of Organ Donation

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester III

Code MSC0523S306T

Third Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - VI

COGNITIVE & SOCIAL PSYCHOLOGY

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Critically evaluate different theories of Intelligence
b) Describe Correspondence Inference Theory
c) Explain the stages of language development and its relation with intelligence

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Describe theoretical explanations of aggression
b) Describe the different stages in creativity
c) Define types of memory and brain process in brief.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Attribution
b) Problem solving skills
c) Interpersonal Attraction
d) Attention and Concentration
e) Social deprivation

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester IV

Code MSC0523S401T

Fourth Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper -I

BIOSTATISTICS & RESEARCH METHODOLOGY

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) What are the measures of central tendency?
b) Define different sampling techniques
c) Define research design. Describe in detail about different types of research methods.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) What is probability ?
b) Explain different Tests of variance
c) What are the research aspects of data presentation. Give methods or tools used in data presentation.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Random sampling
b) ANOVA
c) Methods to present & interpretation of data
d) What is RCTs?
e) What is bio-statistics?

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester IV

Code MSC0523S402T

Fourth Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - II

MEDICAL NUTRITION THERAPY - I

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Describe factors affecting in patient care, counseling & coordinated nutritional services. Also write psychological aspects associated with them.
b) Give details for different tools useful in patient's assessment.
c) Write physiological changes & give diet for pulmonary disorders.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Define nutrition care process.
b) Describe type of diet in cardiac disorders
c) Define infections/ fevers with types & dietary advice for such patients

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Role of nutritionist.
b) Define DASH diet
c) What is GI index & glycemic load.
d) What is IBD & IBS ?
e) What is SOAP

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester IV

Code MSC0523S403T

Fourth Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - III

MEDICAL NUTRITION THERAPY- II

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Essay Type – Plan Medical nutrition therapy for cancer of buccle mucosa patient whose height is 175 cm & weight is 58 Kg, and undergoing chemotherapy & radiation therapy. Also mention the common problems faced by these patients

b) Define special feeding methods in detail.

c) Write standard guidelines for clinical nutrition.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Medical nutritional therapy for liver cirrhosis patients

b) Describe nutrition care in pre & post surgery patients.

c) Write physiological changes & diet management in burn patients

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Write foods to be avoided for CKD patients.

b) Define drug nutrient interaction.

c) What is IBD & IBS ?

d) Role of nutritionist.

e) What is GI index & glycemic load.

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester IV

Code MSC0523S404T

Fourth Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - IV

STRTEGIC MANAGEMENT IN HEALTHCARE

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) What is environmental scanning? Explain different components of external environment.
b) Explain the issues in strategy implementation with regard to establishing a new hospital in a town or buying an existing hospital. Explain with logic.
c) What do you understand by organizational analysis? Explain with reference to financial, marketing, operational, personnel and general management fields? An example would be preferred.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) What are the conditions, risks and benefits of following each of the following strategies.
(a) Cost Leadership.
(b) Differentiation and Focus strategies? Is it possible for a company to follow a cost leadership and differentiation strategy simultatreously? Why or why not?
b) What is strategic evaluation? Do we need to stress upon strategic evaluation control, operational control and management control for its effectiveness? Comment.
c)

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) What do you understand by CSR-
b) Write a brief note on BCG Matrix and GE Matrix
c) Explain Porters five force Model taking an example of your industry
d) Balance score card with an example
e) What do you understand by "VISION" and "MISSON" of an organization? Explain atleast two main elements of vision/ mission of hospital you were immersed in

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester IV

Code MSC0523S405T

Fourth Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - V

YOGA FOR PREVENTION AND PROMOTION OF HEALTH

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Explain the terms Ego and super Ego. Explain the role of ManomayaKosa in ego and one practice for the same.

b) Explain the IAYT practice for creativity development.

c) Explain the steps in anger management.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Write about effect of stress on physical health.

b) Describe about yoga practices for development of memory.

c) Describe yoga practices for voice culture.

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) How Trataka helps in glaucoma ?

b) Define different types of memory.

c) Describe the role of yoga in ego and greed management.

d) How yoga is helpful in stress management?

e) Explain in brief about role of yoga in enhancing concentration of a person

MODEL PAPER

M.Sc. Clinical Nutrition & Dietetics Semester IV

Code MSC0523S406T

Fourth Semester

M.Sc. Clinical Nutrition & Dietetics

Examination Month Year

Paper - VI

SCIENTIFIC WRITTING

Time: Three Hours

Maximum Marks: 70

Attempt all questions

All the parts of one question should be answered at one place.

Only one supplementary copy along with main answer book is allowed

Q. No. 1. Long Answer (Attempt any 2) **2 x 15 = 30**

a) Write in detail about characteristics of scientific writing
b) How would a effective scientific document be written? Explain with example.
c) What are types of visual aids? Describe in detail.

Q. No. 2 Short Essay (Attempt any 2) **2 x 10 = 20**

a) Write about rationale & importance of an research
b) Define data fabrication and falsification.
c) Describe elements of scientific documents

Q. No. 3 Short Notes (Attempt any 4) **4 x 5 = 20**

a) Conflict of Interest
b) What are the outcomes of research and its implications
c) Plagiarism
d) Budgeting
e) Abstracts