FACULTY OF SCIENCE

SYLLABI

FOR

M.Sc. Home Science (Foods & Nutrition)

(Semester System)

Examinations, 2017-18
PANJAB UNIVERSITY, CHANDIGARH

Outlines of tests, syllabi and courses of reading for M.Sc. Home Science (Foods & Nutrition)
1st & 2nd Semester System Examination, 2017-18

SCHEME OF STUDIES

SEMESTER I

1st Semester Exam. Nov./Dec., 2017

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT HOURS</th>
<th>THEORY MARKS</th>
<th>PRACTICAL MARKS</th>
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SEMESTER II

2nd Semester Exam. April/May, 2018

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*Marks will be awarded by the supervisor internally on the basis of synopsis/continuous evaluation.
### Outline of tests, syllabi and courses of reading for M.Sc. Home Science (Foods & Nutrition)  
3rd and 4th Semester System Examinations, 2017-2018

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
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**Total:** 11 7 400

### 3rd SEMESTER Exam. Nov./Dec., 2017

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**Total:** 8 4 350

**Grand Total:** 64 1600

* Marks will be awarded at the end of Semester-IV

** There will be no University exam. of this practical 3rd Semester.
Guidelines for Continuous Internal Assessment

I

(a) Written Test : 25 (reduced to 5)
(b) Snap Test : 25 (reduced to 5)
(c) Participation in Class Discussion : 15 (reduced to 3)
(d) Term Paper : 25 (reduced to 5)
(e) Attendance : 10 (reduced to 2)

Total :100 (reduced to 20 and further reduced to 10)

II  Weightage of 2 marks for attendance component out of 20 marks for Continuous Assessment shall be available only to those students who attend 75% and more of classroom lectures/seminars/workshops. The break-up of marks for attendance component for theory paper shall be as under:

<table>
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<th>Attendance Component</th>
<th>Marks for the theory paper</th>
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<td>a) 75% and above upto 85%</td>
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<td>b) Above 85%</td>
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III  Continuous Internal Assessment Awards must be sent to the Controller of Examinations, by name, two weeks before the commencement of the particular examination on the pro forma obtainable from the examination branch.

SEMESTER I

COURSE NO. 101 : NUTRITIONAL BIOCHEMISTRY-I (Th.)

Maximum Marks : 100
Paper : 90
Int. Asst. : 10

Credits Hours :4/week
Durations of Exam : 3 hours

Instructions to the paper setter:

Question paper will have four sections/units. Examiner will set a total of nine questions comprising of two questions from each section and one compulsory question of short answer type covering the whole syllabus. Student will attempt one question from each unit and the compulsory question.
All questions may carry equal marks, unless specified.

Objectives:
1. To augment the biochemistry knowledge acquired at the undergraduate level.
2. To understand the mechanism adopted by the human body for various metabolic pathways.
UNIT-I

2. Carbohydrate metabolism: Glycolysis, Tricarboxylic Acid cycle, Gluconeogenesis, Hexose Monophosphate pathway, Glycogenolysis, Glycogenesis.

UNIT-II

3. Protein Metabolism: Review of general reaction of amino acid catabolism and urea cycle. Biosynthesis of proteins. Genetic code

UNIT-III


UNIT-IV

7. Nucleic acids : Structure of DNA and RNA (mRNA, tRNA , rRNA) Metabolism: Replication and transcription of nucleic acids
8. Biochemical mode of action of hormones of the thyroid, parathyroid, adrenal medulla, adrenal cortex and pancreas. Regulation of blood sugar level. Regulation of body water and salt level.

RECOMMENDED READINGS:

NUTRITIONAL BIOCHEMISTRY
(PRACTICAL)

Teaching periods: 2p/week
Duration of exam: 3 hours

Note:-
1. Practical will be of 4 hrs duration.
2. Practical paper will be set by the external examiner in advance.

Content:
1. Preparation of standards solutions, buffers and measurement of pH.
3. Tests for proteins:
   (i) Quantitative estimation of amino acids by Ninhydrin Method.
   (ii) Estimation of proteins by Lowry method.
   (iii) Estimation of proteins by Biuret method.
4. Tests for lipids:
   (i) Quantitative estimation of cholesterol
   (ii) Isolation and estimation of total lipids
   (iii) Quantitative estimation of Phospholipids.
5. Tests for Enzymes:
   (i) Isolation and estimation of activity of:
      (a) Amylase
      (b) Protease
      (c) Alkaline phosphatase
   (ii) Effect of temperature, pH and enzyme concentration on enzyme activity.

RECOMMENDED READINGS:

Objectives:
This course should enable the students to –
1. To enable the students to understand what happens to the ingested nutrients at the cellular level and the nutrient interactions
2. To present and discuss methods of determining nutrient requirements for humans and discuss the current figures of nutritional requirements
3. To enable them to translate the knowledge into practical guidelines for dietary needs of humans at different stages of life

UNIT - I
1. Energy needs – Assessment and requirements
   Current approach for estimating RDA for energy intake of different age, sex groups and physiological conditions
2. Metabolic regulation of food intake- weight management through life
   Clinical and biochemical manifestation of over and under nutrition
   Disorders of metabolism – metabolic syndrome/syndrome X and increased cardio metabolic risk.

UNIT - II
3. Dietary carbohydrates – functions of starch, resistant starch, dietary fiber and sugar
   Dietary fiber and its role in health and disease – obesity, satiety, hypertension, glucose tolerance, insulin response, diabetes, heart disease.
   Regulation of level of glucose in blood and hormonal control
4. Functions and human requirements of essential fatty acids
   Role of n3 and n6 fatty acids in health and disease
   Phytochemicals & Plant sterols in human nutrition
   Dietary factors and dyslipidemias- role of MUFA, trans fat, cholesterol, anti oxidants, stanols and sterols
   Lipoproteins-transport and metabolism
UNIT -III

5. Protein turnover, Methods of measuring protein turnover, “N” balance, obligatory loss
   Assessing protein and amino acid requirements – The current approach for various age, sex
   and physiological groups.
   Assessment of protein quality
   Adaptation to fasting and starvation

6. Antioxidants in health and disease
   • Effects of oxidants on macromolecules – carbohydrates, proteins lipids, nucleic acids.
   • Nutrient anti-oxidants with potent health effects
   • Non-nutritive food components with potential effects (Flavonoids – polyphenols and
     tannates, phytoestrogens, cyanogenic compounds).

UNIT- IV

7. Role of leptin and ghrelin in hunger and satiety and weight management
   Causes and effect of deficiency
   Causes and effect of excess

RECOMMENDED READINGS:

• Shils ME, Olson JA, Shike M, Ross AC, Cabellaro B and Cousins RJ (2006). Modern
  Nutrition in Health and Disease (10th ed.). Lippincott, Williams and Wilkins
  publications.
  Washington DC
  series1
• Protein and Amino Acid requirements in Human Nutrition (2007). Joint
• Indian Council of Medical Research. Nutrient requirements and Recommended Dietary
• Human Vitamin and Mineral requirements (2002). Report of a Joint FAO/WHO expert
  consultations, Bangkok, Thailand, WHO & FAO UN, Rome.
  Delhi
  New Delhi
PUBLIC HEALTH NUTRITION I  
(THEORY)

Credit Hours: 2/week
Duration of Exam: 3 hours

Instructions to the paper setter:

Question paper will have four sections/units. Paper setter will set a total of nine questions comprising of two questions from each section and one compulsory question of short answer type covering the whole syllabus. Student will attempt one question from each unit and the compulsory question. All questions may carry equal marks, unless specified.

Objectives
1. To understand the concept of Public Health Nutrition and health care delivery system.
2. To understand the causes and consequences of nutritional problems in the community.
3. To orient the students with the strategies for improving the nutritional status of communities.
4. To understand the concept of food and nutrition security.
5. To learn about the various Government programmes aimed at improving health and nutritional status of the population.

UNIT- I

1. Public Health Nutrition
   • Aim, scope and content of Public health nutrition
   • Role of nutrition in national development

2. Health Care Systems
   • Health – definition, dimensions, determinants and indicators
   • Health care systems in the community

UNIT- II

3. Public Health Aspects of Under nutrition
   • Clinical syndromes of Malnutrition(Clinical Energy Deficiency/ PEM/ SAM)
   • Severe Acute malnutrition and mortality

4. Prevention and management of
   • Malnutrition
   • Anemia
   • Iodine Deficiency Disorders

UNIT -III

5. Approaches/ Strategies for Improving Nutrition and Health Status of the Community
   • Health based interventions including immunization, provision of safe drinking water/ sanitation
• Food based interventions including food fortification, dietary diversification, supplementary feeding and biotechnological approaches.

6. Diarrhea and Malnutrition
• Diarrhea, morbidity, malnutrition and mortality
• Prevention and management of Diarrhea

UNIT –IV

7. Nutrition, agriculture and food Security
• Food and nutrition security: definitions, concept and components of food and nutrition
• Food and nutrition situation and food security in India

8. Food and nutrition security and programmes
• Food insecurity warning and mapping systems for nutritional vulnerability
• Public Sector programmes for improving of food and nutrition security
• Right to Food act
• Public Distribution System

RECOMMENDED READINGS:


PUBLIC HEALTH NUTRITION I
(PRACTICAL)

Total Marks: 50
Paper: 40

Teaching periods: 2p/week
Internal assessment: 10
Duration of exam: 3 hours

1. To plan and prepare low cost nutritious dishes / menus for vulnerable groups.
2. Development of low cost recipes for infants, preschoolers, elementary school children, adolescents, pregnant and lactating mothers

3. Planning and preparation of diet/ dishes for (PEM/SAM/CED, Anemia)

4. Field visits to ongoing national nutrition programmes

RECOMMENDED READINGS:


HUMAN PHYSIOLOGY
(THEORY)

Maximum Marks: 75
Paper: 65
Internal Assessment: 10
Credit Hours: 3/week
Duration of Exam: 3 hours

Instructions to the paper setter:

Question paper will have four sections/units. Paper setter will set a total of nine questions comprising of two questions from each section and one compulsory question of short answer type covering the whole syllabus. Student will attempt one question from each unit and the compulsory question. All questions may carry equal marks, unless specified.

Objectives:
1. To enable the students to understand the relevant issues and topics of human physiology.
2. To enable them to understand the integrated functions of all systems and the grounding of nutritional sciences in physiology.

UNIT-I

1. Blood :
   - Composition of blood: Plasma, RBC, WBC, Platelets
   - Erythropoisis
   - Blood Coagulation and Blood Groups
- Cardiac cycle and cardiac output
- Blood pressure and factors affecting it.
- Hypertension.
- ECG

2. Immunology and Nutrition:
- Human Immunoglobulins
- Cell mediated and humoral immunity – impact of malnourishment.
- Innate immunity - Activation of WBC and production of Antibodies. T cells, B cells.
- Role of thymus.
- Acquired immunity related disease- AIDS, HIV
- Autoimmune disorders – Role of antibodies in pregnancy screening.
- Effects of Vitamins on immunity

UNIT-II

3. Respiratory system:
- Breathing mechanism
- Exchange and transport of gases and its regulation.
- Lung Volumes and capacities

4. Excretory System:
- Mechanism of urine formation
- The role of the kidneys in maintaining water and electrolyte balance.

UNIT-III

5. Digestive System:
- Functions and regulation of the salivary glands, stomach, pancreas, liver and the intestines.
- Mechanism of digestion and absorption of carbohydrates, proteins and fats.
- Role of enzymes in digestion of carbohydrates, proteins and fats.

6. Endocrine System:
- Definition, functions and kinds of hormones.
- Structure and functions of the following glands: Thyroid, parathyroid, adrenal, pancreas, pituitary and pineal gland

UNIT-IV

7. Reproductive System:
- Structure and function of male and female sex glands and organs.
- Ovarian and menstrual cycle.
- Role of hormones in reproduction: FSH, LH, Estrogen, Progesterone, Testosterone and Human Chorionic Gonadotropic hormone (HCG).
- Placenta.
- Physiology of pregnancy, parturition, lactation and menopause.
8. Nervous System and Senses:
- Basic properties of nerve and receptor organs
- Central Nervous System: Brain Spinal Cord
- Transmission of Nerve impulse
- Autonomic nervous system
- Physiology of vision, hearing, taste and smell.

RECOMMENDED READINGS:


Research Methodology and Statistics (Common to all streams)

Theory

Maximum Marks: 75
Paper - 65
Internal Assessment - 10

Credit Hours: 3/week
Duration of Exam: 3 hours

Instruction to the Examiners:

Questions paper will have four units. A total of nine questions comprising of two questions from each unit and one compulsory question of short answer type covering the whole syllabus will be set. All questions may carry equal marks unless specified. Students will be expected to attempt one question from each unit and the compulsory question

Objective:
1. To know the significance of statistics and research methodology in Home Science research.
2. Types, tools, and methods of research and develop the ability to construct data gathering instruments appropriate to the research design.
3. To know about the appropriate statistical technique for based on the specific research design.
UNIT- I

1. Research- meaning, purpose and approaches
   • Exploration, Description, Explanation
   • Research designs- Experimental and Observational

2. Statistics- Scope and Significance in Home Science discipline
   • Descriptive and inferential statistics
   • Functions and limitations of statistics

UNIT-II

3. The Research Process
   • Defining the research problem, research questions, objectives, hypothesis
   • Review of related literature
   • Methodology and tools to be used
   • Citation formats

4. Sampling and Tools
   • Universe and sample
   • Types of sampling

UNIT-III

5. Understanding various statistical measures
   • Simple Arithmetic Mean (direct method)
   • Median and Mode
   • Standard deviation (assumed mean method)
   • Variance

6. Conceptual understanding of Correlation and Regression (Theoretical introduction)
   • Karl Pearson coefficient of correlation and its properties
   • Regression equation and regression lines

UNIT-IV

7. Inferential Statistics
   • Level of significance
   • Standard error and Confidence limits

8. Large sample and small sample tests
   • t-test; Significance of difference between means
   • F- test
   • Chi-square test of independence

References

Research Methodology and Statistics (Common to all streams)
Paper: Practical

Maximum Marks: 50
   Paper - 40
   Internal Assessment - 10

Credit Hours: 2/week
Duration of Exam: 3 hours

Objectives:
1. To provide hands on experience to students about data entry and analysis in Excel and SPSS
2. To familiarise the students with data handling in statistical software.

Contents
1. Basics of Excel- data entry, editing and saving, establishing and copying a formula.
2. Functions in excel, copy and paste and exporting to MS word document
4. SPSS, opening SPSS, layout, menu and icons analyzing the data using different statistical techniques.

References
SEMESTER II

BIOCHEMICAL FOOD ANALYSIS AND INSTRUMENTATION
(THEORY)

Maximum Marks: 50
Paper: 45
Internal assessment: 05

Credit Hours: 2/week
Duration of Exam: 3 hours

Instructions to the paper setter:

Question paper will have four sections/units. Examiner will set a total of nine questions comprising of two questions from each section and one compulsory question of short answer type covering the whole syllabus. Student will attempt one question from each unit and the compulsory question. All questions may carry equal marks, unless specified.

Objectives:
1. To augment the biochemistry knowledge acquired at the undergraduate level.
2. To understand the principles and use of instruments used for biochemical analysis of foods.

UNIT-I

1. Biochemical Techniques : Principles and applications of
   • Homogenization and methods of disrupting cells and tissues. Cell fractionation.
   • Spectroscopy- Beer- Lambert law, UV, Visible Spectrophotometry, Colorimetry

2. Biochemical Techniques : Principles and applications of
   • pH meter
   • Centrifugation (Preliminary introduction to various types of centrifuges)

UNIT-II

3. Biochemical Techniques: Principle and applications of:
   • Chromatography: Adsorption (Column and thin layer), Gel filtration, Affinity, Ion-Exchange
   • Electrophoresis: SDS PAGE and native electrophoresis, agarose electrophoresis, Protein separation & Characterization

UNIT-III

5. Carbohydrates: Qualitative and quantitative analysis of food carbohydrates, Dietary fibre, crude fiber


UNIT-IV

7. Fats: Physical and chemical characteristics of various fats and oils, Iodine value, saponification value, acid value, Reichert-Meissel value of important oils. Storage changes in fats and oils

8. Enzymes: Enzymes involved in food deterioration and preventive measures. Enzymes as aids in food processing operations and economical significance. Biotechnological applications of enzymes.

RECOMMENDED READINGS:

BIOCHEMICAL FOOD ANALYSIS AND INSTRUMENTATION
(PRACTICAL)

Maximum Marks: 50
Paper: 40
Internal Assessment: 10

Credit Hours: 2/week
Duration of Exam: 3 hours

Note:
1. Practical will be of 4 hrs duration.
2. Practical paper will be set by the external examiner in advance.
3. Paper setter will also be an examiner.

1. Estimation of moisture content and titrable acidity of food products.

2. Tests for carbohydrates:
   (i) Estimation of soluble and insoluble ash content
   (ii) Estimation of dietary fibre

3. Tests for proteins:
   (i) Quantitative estimation of proteins by Kjeldhal’s Biuret method Method
   (ii) Separation of amino acids by paper chromatography.
   (iii) Isolation and estimation of Casein from milk.
   (iv) Demonstration of protein separation by gel electrophoresis.

4. Tests for Fats:
   (i) Estimation of free fatty acids
   (ii) Determination of acid and iodine value
   (iii) Determination of RM value

5. Tests for Vitamins & Minerals:
   (i) Estimation of calcium, phosphorous and iron
   (ii) Estimation of vitamins B1, B2 and ascorbic acid

6. Isolation and estimation of phytic acid.

7. Isolation and estimation of trypsin inhibitors activity.

RECOMMENDED READINGS:


CLINICAL AND THERAPEUTIC NUTRITION I
(THEORY)

Maximum Marks: 75
Paper: 65
Internal Assessment: 10
Credit Hours: 3/week
Duration of Exam: 3 hours

Instructions to the paper setter:

Question paper will have four sections/units. Paper setter will set a total of nine questions comprising of two questions from each section and one compulsory question of short answer type covering the whole syllabus. Student will attempt one question from each unit and the compulsory question. All questions may carry equal marks, unless specified.

Objectives:
1. The course is aimed at giving advanced knowledge in the field of clinical nutrition and dietetics
2. The course will enable the students to gain current knowledge about classification, pathogenesis, diagnosis, aetiology, symptoms and dietetic management of various diseases

UNIT – I

1. Diet prescription and nutritional care process – Essential components of diet prescription and steps involved in nutrition care process
2. Nutrition in hospitalized patients – Causes of malnutrition in hospitalized patients, identification of high risk patients, assessment of nutritional status
3. Diet counseling: Definition, responsibilities of a counselor and tips for successful counseling, components of counseling process, formulation of a proforma for diet counseling.

UNIT- II

4. Aetiopathogenesis, clinical picture, diagnostic tests, treatment, preventive aspects.
• Peptic ulcer
• Ulcerative colitis

5. Aetiopathogenesis, clinical picture, diagnostic tests, treatment, preventive aspects.
   • Diarrhoea, dysenteries
   • Malabsorption syndrome
   • IBS

UNIT - III

   Liver disorders:
   • Viral hepatitis types A and B
   • Cirrhosis of liver
   • Hepatic coma

   Renal diseases:
   • Glomerulonephritis
   • Nephrotic syndrome
   • Acute and chronic renal failure – Dialysis

UNIT - IV

8. Nutrition care in immune deficiency diseases: HIV aids
9. Nutrition Care during Cancers

RECOMMENDED READINGS:

• Association of Physicians of India (1998). API Textbook of Medicine, Vol. I and II. Published by Association of Physicians of India.
CLINICAL AND THERAPEUTIC NUTRITION I
(PRACTICAL)

Total Marks: 50
Paper: 40
Internal assessment: 10

Teaching periods: 2p/week
Duration of exam: 3 hours

1. Planning and preparation of diets as per theory
2. Visit to a dietetics department of a hospital and report presentation
3. Market Survey for
   - Nutrition/Dietary Supplements
   - Infant formulas/ foods/ mixes
   - Prebiotic and Probiotic commercial products
   - Therapeutic food products.

RECOMMENDED READINGS:

SEMESTER III

Course No : 114 : PHYSIOLOGY

Marks : 75
Paper : 60
Int. Asst. : 15

Credits/week : 3

Instructions to Paper Setters and the Students :
Question paper will have four sections. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus. Students will attempt one question from each unit and the compulsory question. All questions may carry equal marks, unless specified.

Objectives :
1. To gain knowledge about various organs, their role and functioning.
2. To augment to the nutritional knowledge.
3. To understand causative factors of various diseases/disorders.

Detail of Syllabus

Unit-I

1. Blood :
Composition of blood (only introduction), hemoglobin, erythropoiesis, plasma, proteins and coagulation of blood.

2. Cardio-vascular system :
Basic properties of the heart, cardiac output, cardiac cycle, blood pressure and affecting it and hypertension.

Unit-II

3. Respiration :
Uptake and delivery of respiratory cases and regulation of breathing.

4. Physiology of Kidneys :
Mechanism of urine formation and the role of the kidneys in water and electrolyte balance.

5. Physiology of Digestive System :
Secretory and digestive functions of the salivary glands, the stomach, the pancreas, the liver and the intestines and mechanism of absorption of carbohydrates, proteins and fats.

Unit-III

6. Nervous System :
Basic properties of nerve and receptor organs, spinal cord and brain stem introduction to hypothalamus cerebral cortex-structure and topographical representation, the introduction to automatic nervous system, the electroencephalogram, cerebrospinal fluid.

7. Physiology of special senses :
Physiology of vision, hearing, taste and smell.
Unit-IV

8. **Endocrine:**
   Functions and the different syndromes resulting from medulla, hypo or hyperactivity of the following:
   Thyroid, Parathyroid, Adrenal Cortex, Adrenal Medulla, Endocrine, Pancreas, Pituitary Glands.

9. **Reproductive System:**
   Formation of gametes, the ovum and the sperm, spermatogenesis
   (reproductive cycle in male, hormonal control) and oogenesis (Review, reproductive cycle in female, hormonal control, ovarian and uterine cycle).
   Pregnancy and mammary glands.

**Books Recommended:**

2. Hower E., Histology.
5. Davidson, B., and Smith E., Text Book of Physiology and Biochemistry, 1972(8th Ed.)

**Course No: 115 : INSTITUTIONAL MANAGEMENT (Th.)**

<table>
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**Credits/week : 2**

**Instructions to Paper Setters and the Students :**

Question paper will have four sections. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus. Students will attempt one question from each unit and the compulsory question. All questions may carry equal marks, unless specified.

**Objectives :**

1. To develop a knowledge base in key areas of institutional food management.
2. To impart necessary expertise to run a food service unit.
3. To provide practical level experience in managing food service management.
4. To critically evaluate the functioning of food service units.

**Details of Syllabus**

**Unit-I**

1. Institutional management with emphasis on catering. Review of different types of food service operations. Commercial, non-commercial food service institutions.
a) Basic factors involved in successful institutional meal planning.
b) Types of food service – formal and informal
c) Procedures involved in construction of recipes in large scale cooking

3. Importance of food standards.
   Need for knowledge as to what constitutes good products, criteria for good quality products,
hazards of poor quality, quality control, Specification for quality in food products.

Unit-II

4. Organisation - definition and types.

5. Management - definition, principles and functions. Tools of management

6. Physical plant- its location, floor plans, space allowance, kitchen units- storage, preparation, serving
   and dish washing units.

Unit-III

7. Cost control
   a) Food cost, Labour cost, Maintenance cost
   b) Budgets
   c) Records
   d) Portion control

8. Personnel Management
   1. Personnel and leadership qualities for food service administration.
   2. Types of labour, criteria for selection, employment conditions, role of union, welfare
      provisions.
   3. Labour and employees training.
   4. Labour laws and legal aspects- health & safety of employees, welfare policies.

Unit-IV

9. Hygiene and Sanitation
   i) Personal hygiene- Importance of personal cleanliness in handling and serving
      food. Health examination of personnel.
   ii) Sanitation in handling food and equipment.
      a. Preventing contamination of cooked food and handling of fresh foods like salads
         and fruits.
      b. Cleaning and hygienic handling of cooking and serving utensils.
      c. Insect and Rodent control
      d. Safety, general safety rules in food preparation and service area. Accident
         prevention

10. Equipment- Types of equipment- criteria for selection, operation and care.
Books Recommended:
1. West Wood A; Harper Food Service in Institution.
2. West, Bessin, Brooks; Food Service in Institutions
3. A.M. Home Economics Association; Hand Book of Food Preparations:
4. Sweetman, M.M. 4, Mac, Keller; Food Selection and Preparation:
5. Oliver B., Watson; School Lunch Room Service
6. Lender H. Katshever and Margret E. Terrel; Food Service Planning: Layout Equipment
7. Davidson and Passmore- Human Nutrition and Dietetics.

Course No. : 116 : INSTITUTIONAL MANAGEMENT (Pr.)
Credits/Week : 2
Marks : 75
(Only Internal)

Note: 1. The marks will be awarded at the end of the semester.
      2. The marks will be awarded by the Internal Examiner only.

1. Standardization of five selected quality recipes in relation to nutritive value, cost, time, equipment.
2. Practical training in running a canteen for 50 members or more.
3. Project:- To prepare a report - visits to different service institutions, observation of organization, plant lay out, food preparation and Service Personnel Management.

Course No. 117 : SCIENTIFIC WRITING (Pr.)

Marks : 50
Paper : 40
Int. Asst. : 10

Credits/week : 2

Note:
The external examiner will conduct the viva voce.
Practical will be based on continuous internal assessment.

Instructions to Paper Setters

Note:
1. Each practical paper will be of three hours duration.
2. The question paper should cover the entire syllabus.
Objectives:

To be able to appreciate and understand the importance of writing scientifically.
To develop competence in writing and abstracting skills.

Contents

1. Scientific writing as means of communication
   Different forms of scientific writing (articles in journals, research notes and reports review articles, monographs, dissertations, bibliographies, book chapters, and articles in other publications).

2. How to formulate outlines
   The reason for preparing outlines as a guide for plan of writing and as a skeleton for the manuscript.
   Kinds of outlines (topic outlines, conceptual outline, sentence outline, combination of topic and sentence outline).

3. Drafting titles, subtitles, tables, and illustrations.
   Tables as systematic means of presenting data in rows and columns and lucid ways of indicating relationships and results.
   Formatting tables.
   Appendices: Use and guidelines.

4. The writing process
   Getting started.
   Using outline as a starting device.
   Drafting.
   Reflecting, rereading (checking organization, checking headings, checking content, checking clarity, checking grammar).
   Brevity and precision in writing.
   Drafting and re-drafting based on critical evaluation.

5. Parts of dissertation/research report/article
   Introduction
   Review of literature
   Methods
   Results and discussion
   Summary and abstract
   References

6. Writing for grants
   The question to be addressed
   Rationale and importance of the question being addressed
   Empirical and theoretical framework
   Presenting pilot study/data or background information
   Research proposal and time frame
   Specificity of methodology Organization of different phases of study Expected outcome of study and its implications Budgeting
   Available infra-structure and resources
   Executive summary
Books Recommended:

Course No. : 118: THERAPEUTIC NUTRITION (Th.)

Marks : 100
Paper : 80
Int. Asst. : 20

Credits/ Week : 4

Instructions to Paper Setters and the Students
Question paper will have four sections. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus. Students will attempt one question from each unit and the compulsory question. All questions may carry equal marks, unless specified.

Objectives :
1. To understand causative factors and metabolic changes in various diseases/disorders
2. To learn principles of diet therapy.
3. To appreciate the significance of dietary counseling.
4. To understand principles of prevention of various diseases/disorders.
5. To learn dietetic food product development.

Detail of Syllabus

Unit-I

1. Therapeutic modification of the normal diet. Normal soft and liquid diets and parental feeding.
2. Etiology, clinical and bio-chemical manifestation and dietary counseling for the following diseases:
   Review of Gastro intestinal diseases.
   a. Peptic ulcer - astatic and duodenal ulcers.
   b. Diarrhoeas - acute and chronic.
   c. Constipation - atonic and spastic.
   d. Mal absorption syndromes - Carbohydrates and fat intolerance sprue, celiac diseases.

Unit-II

3. Liver Diseases:
   a. Infective Hepatitis, Cirrhosis.
   b. Gall bladder diseases.
4. Diabetes: Juvenile and adult, onset, types.
   Types of insulin and their action, Oral hypoglycemic drugs.

Unit-III

5. Cardiovascular disorders:
   Hypertension, Atherosclerosis, coronary heart disease.
6. Febrile conditions, acute and chronic.

**Unit-IV**

7. Renal Disorders:
   Glomerulonephritis, Nephrotic syndrome, acute and chronic renal failure


**Books Recommended :**

2. Williams and Wilkins Co, Diabetes Mellitus, U.S.A.
9. Anita, F.P., Clinical Dietetics and Nutrition
10. Pyke, Maonus, Food Science and Technology.

**Course No. : 119: THERAPEUTIC NUTRITION (Pr.)**

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**Credits/ Week : 3**

**Note :**
- Each practical paper will be of three hours duration.
- The question paper should cover the entire syllabus.

**Contents**

1. Planning, calculations, preparation, serving and evolution of general and therapeutic diets for diseases covered in theory.
2. Study of the management of food services in selected hospitals.
3. Visits to dietetic clinics in hospitals- case study of patients needing specific therapeutic diets.

4. Internship in a hospital for 6 weeks, after the semester examination is mandatory for the award of degree.

**Course No. : 120 : DISSERTATION**

**Credits/week : 2**  
**Total : 100 Marks**

**Objective :**

To undertake an independent piece of research work in a relevant area of Food and Nutrition

1. The research work should contribute to the advancement of knowledge in the field. The students must be guided and supervised by a member of the teaching faculty of the department. Each student must submit written dissertation at the end of 4th semester of M.Sc. Viva-Voce is organized for assessment. Dissertation should include introduction, methodology, results and discussion, summary and conclusions and references.

2. Marks will be awarded at the end of 4th semester, after the submission and evaluation of dissertation through a viva-voce examination.

3. The marks will be awarded jointly by the internal and external examiner.
SEMMSTER IV

Course No. : 120: DISSERTATION

Credits/week : 2

Objective :

• To undertake an independent piece of research work in a relevant area of Food and Nutrition

1. The research work should contribute to the advancement of knowledge in the field. The students must be guided and supervised by a member of the teaching faculty of the department. Each student must submit written dissertation at the end of 4th semester of M.Sc. Viva-Voce is organized for assessment. Dissertation should include introduction, methodology. Results and discussion, summary and conclusions and references.

2. Marks will be awarded at the end of 4th semester, after the submission and evaluation of dissertation through a viva-voce examination.

3. The marks will be awarded jointly by the internal and external examiner.

Course No. 121 : FOOD SCIENCE (Th.)

Marks : 75
Paper : 60
Int. Asst. : 15

Credits/ Week : 3

Instructions to Paper Setters and the Students

Question paper will have four sections. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus. Students will attempt one question from each unit and the compulsory question. All questions may carry equal marks, unless specified.

Objectives :

1. To have coherent systematic knowledge and understanding of the physical, chemical, nutritional and other scientific changes occurring in foods as a result of various conditions.

2. To understand the importance of quality assurance in food industry and various tests and standards for quality assessment.

3. To appreciate the importance of basic concepts GMP, GHP, HACCP, TOM and risk assessment.

4. To understand the various aspects of food product development, labeling, marketing, consumer research and entrepreneurship.
Detail of Syllabus

Unit-I

1. **Food acceptability- factors affecting it**: Sensory evaluation of food using different methods.

2. **Relation of cookery to colloidal chemistry**: Definition of colloidal systems alerting degree of dispersion, Hydrophilic and Hydrophobic colloids, stabilization of colloidal systems, properties i.e. surface tension, absorption, foam, formation, Rheology, gel formation and emulsions.

3. **Sugar Cookery**: Sources, uses and properties. Crystallization of sugar, Stages of sugar cookery. Crystalline and non-crystalline candies: fondant, fudge, caramel and brittles.

Unit-II

4. **Starch cookery**:
   a. Sources and uses of starch, gelatinization
   b. Flours Composition and baking qualities. Batters and doughs (Chapattis and puris).
   c. Leavening-agents
   d. Cooking and parboiling of rice.


Unit-III


8. **Grams and Dhals**: Composition, methods of processing and cooking. Effect of processing such as roasting, parching, soaking, germination and fermentation.

Unit-IV

9. **Vegetables and fruits**:
   a. Structure, texture, pigments and acids in vegetables and fruits, Browning reaction.
   b. Pectic substances: Characteristic, uses, theory of pectic-gel formation, testing of pectin, factors affecting jelly formation.

Books Recommended:

1. Low, Bells, Experimental Cookery.
2. Sweetman, M. D., Food Selection and Preparation.
3. A.N. Hime, E.C. Asso, Handbook of Food Preparation.
5. Swaminathan, Experimental Foods.

Course No. 122: FOOD SCIENCE (Pr.)

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Credits/week: 2

Note:

- Each practical paper will be of three hours duration.
- The question paper should cover the entire syllabus

1. As related to theory.
2. Formulation, sensory evaluation and standardization of recipes from foods mentioned in the theory.

Course No. 123: COMMUNITY NUTRITION (Th.)

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Credits/week: 3

Instructions to Paper Setters and the Students:

Question paper will have four sections. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus. Students will attempt one question from each unit and the compulsory question. All questions may carry equal marks, unless specified.

Objectives:

1. To understand the causes/determinants and distribution of nutrition problems in society.
2. To understand the consequences of nutritional problems.
3. To be familiar with various approaches to nutrition and health interventions programmes and policies.

Detail of Syllabus

Unit-I

1. Causes of Malnutrition- Agent, host and environment factors.
2. Combating some of the public health problems by:
a. Immunisation  
b. Supplementary feeding programmes.  
c. Improving the quality of food produced by genetic approach and fortification.  
d. Supplementation.  
e. New improved foods.

Unit-II

3. Food Toxins:  
   a) Natural  
   b) Chemical  
   c) Microbial

4. Effect of toxins on health and nutritive value of food.

Unit-III

5. Food preservation and Principles of Food Preservation

6. Methods of Food Preservation:  
   a) Dehydration  
   b) Use of Low Temperature  
   c) Canning  
   d) Irradiation  
   e) Home Presentation.

Unit-IV

7. Communication media & methods in nutrition education - Administration of nutrition programme in India and assessment of existing programmes.


Books Recommended:

5. Arvind, W., Nutrition in Community.
Course No. 124: COMMUNITY NUTRITION (Pr.)

Credits/week: 2

Note:
- Each practical paper will be of three hours duration.
- The question paper should cover the entire syllabus

1. Development of low cost recipes based on substitute food and better quality.
2. Assessment of Nutritional status of Community by using dietary, anthropometric measurements. (Reports to be submitted in the practical exam.)
3. Preparation and effective use of aids for nutrition education.

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