M.Sc. (Home Science)
Food and Nutrition

SEMESTER-II
PAPER-I
Advance in Food Microbiology

Objectives
1. The course will enable the students to gain deeper knowledge of micro organism in human environment and to understand the importance of microorganism in foods technology.
2. To understand legal aspects in areas.
3. To develop skills in handling food safety.
4. To know the food borne diseases and how to prevent it.

UNIT-I
Introductions to Food Microbiology
1. Historical development of Microbiology and Food Technology Regulations and Standards in Food legislation.
2. Environmental Microbiology: Bacteria Mold, fungi, yeast and virus their morphology, cultural characteristics biochemical activities, their sources foods.
UNIT - II

Estimation and Isolation of Micro Organisms:
1. Historical development of Microbiology and Food Technology Regulation and Standards in food legislation
   - Conventional methods; SPC
   - Immunological Methods: RIA, ELISA, FIA
   - Chemical Method: ATP measurement and PCR (Polymers-Chain Reaction)
   - Rapid methods (new techniques)
2. Microscope colony count, Analysis, DMC (Direct Microscopic Count)
3. Estimation of the number 'O' Microorganisms, MPN (Most Probable Numbers)

UNIT-III

Microbiology of different foods:
1. Major cause of food spoilage, principles of food preservation control of microorganisms: by destruction and by retarding growth. Microbial Intoxication in food groups such as Milk & Milk products cereals, Meat, fish egg, fruits & vegetables cammed foods.
2. Foods, Borue disease: (Bacterial and virus) Signs/Symptoms and prevention
   - Staphylococcal Gastroenteritis
   - Clostridium perfringer
   - Botulinum and Vibro
   - E-coli, Salmonella, Shingellae
   - Poliomyelitis
   - Infectious Hepatitis
UNIT-IV

Microbiology safety of foods:
1. Indicators of food safety and quality, indicator organisms: methods for detection. Microbiology criteria of various foods products and their significance definition sampling plan.
2. HACCP System, Food safety used in controlling Microbiological Hazards
3. Antimicrobial compounds: Biologically based preservation system, probiotic bacteria.

UNIT-V

Role of Microbes:
Its advantages and disadvantages in food production. Use of microorganism in Diary products, Meat, Fish, Beverage.

Bread and Idli: Beer, Wine, Yoghurt etc
Apparent health benefits of fermented foods and the role of microbes.

GMF (Genetically Modified Foods)
Definition, use advantages and characteristics of GMF, GM applications, For future by Genetically modified organisms.

References:

Journals

12. Journal of Food Science Published by the Institute of Food Technologists, Chicago Il. USA.
13. Journal of Food Science and Technology Published by Association of Food Scientists and Technology (India) CFTRI Mysore.
14. Food Technology published by the Institute of Food Technologists, Chicago Il. USA.
Objectives
This course will enable students to:
1. Augment this Biochemistry knowledge acquired at the undergraduate level.
2. Understand the mechanisms adopted by the human body for regulation of metabolic pathways.
3. Get an insight into interrelationship between various metabolic pathways.
5. Understand integration of cellular level metabolic events to nutrition disorder and imbalances.
6. Understand the principals of various analytical for nutrition research.
7. Familiarize with the application of the above techniques.

UNIT-I
Vitamin and traces elements in the function of enzymes.
Detoxification in body metabolism of foreign compounds.

UNIT-II
Membrane structure assembly and function.
Hemoglobin and its metabolism

UNIT-III
Basic of instrumentation physio-chemical principals and methodology colorimetry, photometry - flopurimetry, flame photometry and atomic absorptionmetry.
UNIT-IV

Electrophoresis - principles and applications in paper and gel electrophoresis. Chromatography principals and applications in paper (circular, ascending and descending) iron exchange column thin layer gas liquid and high performance.

Chromatographic techniques

Isotopes and their use radio active stable isotopes.

Immunological method RIA and ELISA

UNIT-V

Bioeneretics and metabolism a survey of metabolism anabolic catabolic pathways, their differences role of ATP cycle in bioenergetics.

Biological oxidation respiratory chain oxidative phosphorylation

Project - Project report to be submitted by the students guided by the teachers based on the course content of the paper.
Objectives
This course will enable students to:
1. Understand the nature of important nutrition problems and their prevention and control.
2. Study and understand the Epidemiology of communicable diseases and nutrition related problems prevalent among the affluent and the less privileged groups.
3. Study the biochemical and clinical manifestations preventive and therapeutic measures of common nutrition and health problems.

UNIT-I
Epidemiology
Definition aims and approaches
Measurement and its roles
Method in Epidemiology in brief
Uses of epidemiology
Epidemiology of communicable diseases
Dengue Plague cholera mumps tetanus rabies tuberculosis etc.

UNIT-II
Dynamics of disease transmission
Sources Modes and susceptible host.
Disease prevention and control early diagnosis, notification, investigation, isolation, quarantine, treatment and disinfections.
Host defenses: Active and Passive immunity.
Immunization programme in India.
UNIT-III
Nutritional problems of the community.
Problems of vulnerable groups
National and Global nutritional problems prevention and control of Famine Disaster, War, Relief feeding Emergency feeding etc.
Basic concepts & facts about HIV/AIDS
(a) Transmission of HIV infection, signs & symptoms of AIDS.
(b) Diagnosis of HIV infection.
(c) Management & care of HIV infected persons.
(d) Content of communication about HIV/AIDS
(e) Preventive of HIV infection

UNIT-IV
Historical background, prevalence, etiology, biochemical and clinical manifestation, preventive and therapeutic measures for the following:
Protein Energy Malnutrition
Vitamin A deficiency
Nutritional Anaemia
Iodine deficiency disorders
Rickets osteomalacia and osteoporosis
Fluorosis

UNIT-V
Historical Background, prevalence, etiology, biochemical and clinical manifestation, preventive and therapeutic measures for the following:
Obesity and Overweight
Diabetes mellitus
Coronary Heart disease
Cancer
SARS
Other nutritional problems
Lathyrisim, dropsy, aflatoxicosis, alcoholism
M.Sc. - Food and Nutrition
II ND SEMESTER
PAPER-IV
Statistics & Computer Application

Objectives

- To understand the role of statistics and computer applications in research.
- To apply statistical techniques to research data for analyzing and interpreting data meaningfully.

Note: Special instructions should be send to paper setter to set one theoretical questions and its option should numerical question.

Unit-I

- Classification and tabulation of data.
- Graphic presentation, frequency distribution, histogram, frequency, polygons, ogive.
- Average of position in individual, discrete and continuous series.

Unit-II

- Normal distribution - Characteristics, deviation from normality.
- Measures of variability - range quartile deviation, Mean Deviation, Standard Deviation or SD.

Unit-III

- Testing to of hypothesis, Type I and Type II errors.
- Non parametric Methods Chi-square test, Application of student T test for Small samples.
- Difference in proportion for means and difference in means - Critical ratio.

Unit-IV

- Correlation - Meaning, types.
- Coefficient of correlation by Scatter diagram, rank correlation, product Movement method.
- Analysis of variance - nature use & basic Concept one and Two-way.

Unit-V

- Experimental Design: Nature, types, Single group two group control
- Experimental group.
- Randomized block design
- Latin square design
- Factorial design