

M.Sc. (Home Science)  
Food and Nutrition  
SEMESTER-II  
PAPER-I  
Advance in Food Microbiology

~~20-18-19~~ 2021-22

M.M. 100

Objectives

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.

To understand legal aspects in areas.

To develop skills in handling food safety.

To know the food borne diseases and how to prevent it.

UNIT-I

Introduction to Food Microbiology

Historical development of Microbiology and Food Technology Regulations and Standards in Food legislation.

**Environmental Microbiology:** Bacteria Mold, fungi, yeast and virus their morphology; cultural characteristics biochemical activities, their sources foods.

Factors affecting growth of micro organism in Foods Intrinsic and extrinsic parameter.

Conditions that influence microbial growth in food.

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**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 micro organisms: 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 perfinger
  - Botulinum and Vibro
  - E-coli, Salmonella, Shingellae
  - Poliomyelitis
  - Infectious Hepatitis

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**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 Dairy 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:**

1. Topley and Wislsons (1983) Principles of Bacteriology, Virology and Immunity, Edited by S.S. Wilson, A Miles and M.T. Parker, Vol. I: General Microbiology and Immunity, II: Systematic Bacteriology, 7th Edition, Edward Arnold Publisher.
2. Block, J.G. (1999) Microbiology Principles and Explorations, 4th Edition John Wiley and Sone Inc.
3. Frazier, W.C. (1988) Food Microbiology, Mc Graw Hill Inc. 4th Edition.
4. Jay, James, M. (2000) Modern Food Microbiology, 6th Edition, Aspen Publishers, Inc. Maryland.
5. Banwant, G. (1989) Basic Food Microbiology, 2nd Edition CBS Publisher.

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M.Sc. (Home Science)  
Food and Nutrition  
SEMESTER-II  
PAPER-II  
Applied Biochemistry and Technique

~~20-18-19~~ 2021-22

M.M. 100

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.
4. Become proficient for specialization in nutrition.
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

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**UNIT-III**

Basic of instrumentation physio-chemical principals and methdology colorimetry, photometry -  
florourimetry, flame photometry and atomic absorptionmetry.

**UNIT-IV**

Electrohoresis - 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**

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

Biological oxidation respiratory chain oxidative phophorylation

Project - Project report to be submitted by the students guided by the teachers based on the  
course content of the paper.

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M.Sc. (Home Science)

Food and Nutrition

SEMESTER-II

PAPER-III

Nutrition and Health Problems

~~20-18-19~~ 2021-22

M.M. 100

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.

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**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
  - Lathyrism, dropsy, aflatoxicosis, alcoholism

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M.Sc. (Home Science)  
Food and Nutrition  
SEMESTER - II  
PAPER-IV  
Statistics & Computer Application  
~~20-18-19~~ 2021-22

M.M. 100

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 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 Anova.

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**Unit-V**

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

**Total Marks: 50**

**PRACTICAL**

**STATISTICS & COMPUTER APPLICATION**

1. Tabulation
2. Graphic Presentation, Frequency curve, Histogram, Frequency, Polygons, Ogive.
3. Calculation of Mean, Median, Mode
4. Calculation of Standard Deviation.
5. Correlation

**Note:** Student should be given hand on experience to use appropriate software packages for selected statistical analyses.

**Reference:**

- Garrett, Henery E. (1971) Statistics in Psychology and education, David Heley and Co.
- Edwards: Experimental Design in Psychological research.
- Kerlinger: Foundation of Education Research.
- SPSS/PC for the IBM PC/Xt. SPSS Inc.
- Goyal mathematics Statistics
- Levin Statistics for Management.
- Yule An Introductory to the theory of statistics.
- Moud Introduction to the theory of statistics.
- Freund Mathematical statistics.
- Patri Statistical methods.
- Choundan Statistics for Business and Economics
- Singh Principal of Statistics
- Thamligom research methodolgy
- Kothari research methodology
- Agrawal Basic Statistics
- Sankhyaki ke mule siddhant (Hind) Or. H.K. Kapil.
- Sankhakiya vidhiya vayvhar.park vigyano mai by Dr. S.P. Gupta.
- Fundamental of research Keriliger
- Anusandhan Vidhiya by Parasnath.

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