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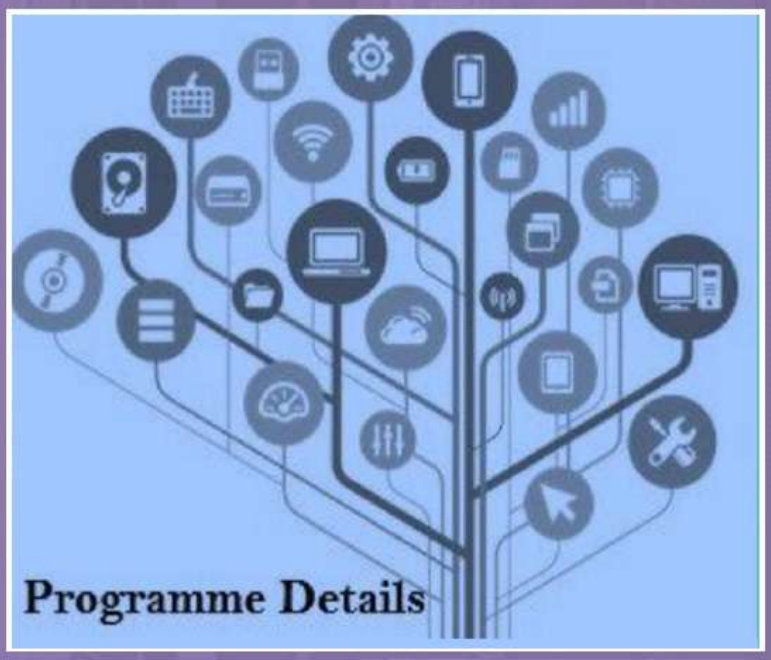
University of Mysore

(Estd.1916)

Ph. D. in FOOD SCIENCE AND NUTRITION



UNIVERSITY OF MYSORE
Department of Studies in Food Science and Nutrition
Manasagangotri, Mysuru-570 006

Regulations and Syllabus
Ph. D. in FOOD SCIENCE AND NUTRITION

Chairperson
BOS in Food Science & Nutrition
University of Mysore
Mysuru - 570 006

UNIVERSITY OF MYSORE

GUIDELINES AND REGULATIONS
LEADING TO
PH. D. IN FOOD SCIENCE AND NUTRITION

Programme Details:

Name of the Department	:	Department of Studies in Food Science and Nutrition
Subject	:	Food Science and Nutrition
Faculty	:	Science and Technology
Name of the Course	:	Ph.D.

PH.D. IN FOOD SCIENCE AND NUTRITION

Programme outcome

1. Helps the researcher to critically analyze the data to address the research goals in their discipline
2. Exhibits skills of Communication both oral and written to publish and present research work
3. To develop and evaluate innovative food formulations
4. To determine the processes involved in the product development
5. To plan the study design according to the research problems and to address the goals.
6. To apply knowledge of research methodology in epidemiological and interventional studies
7. To understand and address the community health problems

COURSE-I: ADVANCED RESEARCH METHODOLOGY

Course outcome

a. Facilitates the students to understand the concepts and the procedures/ or steps to be f ollowed in different research types and designs methodology, ethical issues
b. Enable the students to have solid foundations of knowledge of biostatistics, to develop skills to choose and apply appropriate statistical methods for analyzing the data and to interpret statistical findings correctly
c. To acquire the skills to organize and conduct research, skills of writing a report or thesis

Pedagogy

1. Instructional conversation
2. Constructivism
3. Workshop and hand on experience of statistical method and analysis

COURSE CONTENT

UNIT 1. RESEARCH METHODOLOGY

a. **Research Methodology:** Meaning and Objectives of research; Types of research [Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative,

Conceptual vs. Empirical, Field setting vs. laboratory, clinical vs. diagnostic, Exploratory vs. Formalized]; Research Approaches [Qualitative approach and Quantitative approach] Significance of research; Basic concepts about research and scientific method; Research process.

b. **Defining the Research problem**: Meaning of research problem; Selecting the research problem; Techniques involved in Defining problem.

c. **Research Designs:** Meaning, need, features of a good design, concepts relating to research design, Different research designs – Exploratory research studies, descriptive and diagnostic research studies, Longitudinal, cross-sectional and sequential studies; Hypothesis-testing research studies; Basic principles of Experimental designs; Important experimental designs; Evaluation and Interventional designs.

UNIT 2. STATISTICAL METHODS

a. Statistical Methods 1: (Concept only) - Review of basic statistics; Descriptive statistics. Normal distribution and its properties, Methods of correlation and regression (simple and multiple), Statistical Inference-testing of hypothesis, parametric tests-testing the significance between two means; independent two sample t-test and paired sample t- tests.

b. Statistical Methods 2: (Concept only) - Analysis of Variance (ANOVA), Types, basic model, One way and Two way ANOVA, Need for post hoc tests, repeated measures ANOVA, Multivariate techniques: Principle component analysis, Discriminant analysis, Cluster analysis, Multivariate analysis of variance (MANOVA). Nonparametric tests; Consequences of failure of assumptions underlying parametric tests, Man-Whitney U tests, Kruskal-wallis test, Wilcoxon signed rank test, Friedman's test. Analysis of qualitative data; Chisquare test for independence, measures association-contingency coefficient and Cramer's, measures of agreement-Kappa coefficient.

c. Computer application in analysis of data.

UNIT 3. SCIENTIFIC WRITING

a. **Interpretation:** Meaning, Techniques and precautions in interpretation.

b. **Scientific writing:** Significance and steps in scientific writing, Review of literature, Authenticity of reviews, Layout of the research report writing, Types of Reports, Mechanics of writing a research report, Precautions for writing research reports: Writing the research articles and project proposal

UNIT 4. RESEARCH DESIGNS IN NUTRITION

A. Nutritional epidemiology
   i. Levels of epidemiologic research (primary, secondary and tertiary prevention)
   ii. Observational studies – cross-sectional, case-control, cohort (prospective, retrospective,time- series)
   iii. Types of analysis – eg., incidence rate, prevalence rate.

B. Experimental studies
   i. Pre-clinical studies - Laboratory based *IN VITRO* and animal studies
   ii. Clinical studies - Human intervention trials. Types - Randomized controlled trials (RCT), Non-randomized trial.

C. Ethical issues, Informed consent process, Regulations and Guidelines for research on human subjects.

UNIT 5. NUTRITION RESEARCH

Data collection- Principles, definition and examples in nutrition research for the following.

A. Quantitative tools
   i. Direct parameters – Application of anthropometry, dietary survey, clinical, biochemical and growth monitoring tests, body composition tests and physical fitness tests.
   ii. Indirect parameters – vital statistics, population tests, socio –economic indices, KAP surveys.

B. Qualitative research tools- Types of interviews, Focus group discussions, Free listing and pile sorting, Narrative, Case studies, Participatory methods.

C. Integrating qualitative and quantitative methods.

D. Nutrition Intervention: Tools & techniques to facilitate nutrition intervention. Biomarkers and their use in nutrition intervention

UNIT 6. Research Techniques in Food Science and Nutrition

A. Analytical techniques for determination of food composition.

B. Techniques in sensory analysis.

C. Product development and consumer behavior.

D. Food behavior surveys.

UNIT 7 PUBLIC HEALTH NUTRITION

A. Global Nutrition Scenario- Determinants of Nutritional status, prevalence of deficiencies in different age groups, country wise comparison and differences

B. Agricultural scenario- Global and National, demand and supply patterns, changes over time, impact on diet and nutrition. Food security, Nutritional security and public policy- India's status today

C. National & International nutritional policies and programs, organizations/associations working in the area of Food science & Nutrition

UNIT 8 EMERGING TECNOLOGIES FOR IMPROVING QUALITY & VALUE

A. Processed foods

B. Functional foods

C. Genetically modified foods

D. Nanotechnology

Principles, techniques, applications, food safety and their role in alleviation of malnutrition

COURSE-II: REVIEW OF LITERATURE

Course outcome

a. Facilitate the researchers to have solid foundations of knowledge of research approach, methodologies used in earlier studies on research topic
b. To be comprehensive and collect and synthesize the literature relevant to the research
c. To enable the researchers to learn the skills of presenting the final findings by researching similar studies.