COURSE PROFILE – (2019-2020 MPHIL FOOD AND NUTRITION)

Course profile Paper	Course code	Title of the paper	Credits	Hours/ week	Total hours	CA	SA	Viva	Total
1	13M19/RML	Research Methodology and Introduction to Teaching/Learning Process	5	5	75	40	60	-	100
2	13M19/APF	Advanced Paper in Foods and Nutrition	5	5	75	40	60	-	100
3	13M19/IE1* OR 13M19/IE2*	Elective- Internal paper on product development & nutrient analysis OR Elective 2- Internal paper on nutritional survey, assessment, supplementation and counselling	5	5	75	40	60	-	100
4	13M19/PRO	Dissertation	21			50	100	50	200
Total			**36**						

*Internal valuation only

The above course offered to the M. phil programme enriches the skills of employability, entrepreneurship & skill development which caters the needs of the students.

PAPER - 1

RESEARCH METHODOLOGY AND INTRODUCTION TO TEACHING / LEARNING PROCESS

TOTAL HOURS: 75 Hours **COURSE CODE: 13M19/RML**
CREDITS: 5

COURSE OBJECTIVES

To define the Principles and Techniques in defining and formulation of research problems
To demonstrate their understanding of facts and ideas on the principles of teaching and learning and infer the best teaching methodology in the classroom.
To apply the concept of research methodology in constructing research design and their implementation
To analyse and compare the data collected using appropriate statistical methods
To deduce and make judgements based on the results obtained and assess the validity using statistical significance and
To develop best evaluation methods of internal assessment in the classroom and discuss the need to ensure effective student participation in the classroom and teacher student relationship

COURSE OUTLINE

UNITI: Formulation of a research problem: Research designs -meaning, principle and components
Ethical importance of content, privacy and confidentiality in research; Guidelines for research on human subjects; Issue of academic fraud and plagiarisms; copyright, citations and acknowledgement, authorship and publications
Design of experiments, principles of experimentations
Sampling methods, different types of sampling designs, sampling errors, sampling bias
Methods and tools of data collection: Observation, questionnaire, interview, checklist, rating scale, attitude scale, reliability and validity of tools. (15 HOURS)

UNIT II: Linear Programming - type of variables, solving problems, interpretation, use in field of Food & Nutrition. Data processing using the computer coding and classification, programming and analysis (15 HOURS)

UNIT III: Processing and analysis of data:Editing, coding, classification, tabulation, Parametric or standard tests, chi-square test; Analysis of variance and covariance; Non-parametric or distribution free tests;

Uses of multivariate analysis techniques (concepts only) classification, methods - factor analysis and path analysis, cluster analysis; Handling of qualitative and quantitative data
Report Writing: Significance, different steps in writing a report, Drawing inferences, evaluation. (15 HOURS)

UNIT IV: Methods of teaching/learning relevant to higher education:Objectives, advantages, limitations; Methods relating to different levels instructional, self-study, seminar, participatory method; Laboratory and project work, case study, field trips etc., Innovations in nutritional fields. Methods used in non-formal education, vocational training, adult education. (15 HOURS)

UNIT V: Organization, Planning and management of the classroom/field:Planning course work, practical work, field trips, seminar etc., Teacher - student relationship, Student interaction and participation.
Evaluation methods - classroom / field; objectives and functions of evaluation, principles of evaluation; Tool for testing / evaluation: Internal assessment - teacher - made tests, objective type, short answer and essay questions, construction of questions and question bank, performance tests, observation technique, product evaluation, appraising personality traits. The marking and grading systems.
(15 HOURS)

RECOMMENDED TEXT BOOKS

- William Giles Campbell, *Form and style in Thesis writing*, Houghton Mifflin Company, Boston.
- Elhance .D.N, Veenaand and Agarwal .B.M, *Fundamental of statistics*,48thEdition, KitabMahal, Allahabad, 2005

REFERENCE BOOKS:

1. Singh, Y.K, *Fundamental of Research Methodology and Statistic*. New Age International (P) Ltd., Publishers. New Delhi, 2015
2. Kothari, C. and Garg, G, *Research methodology Methods and Techniques* 3rd edition, New Delhi: New Age International (P) Ltd, 2014
3. Gupta. S.P, *Statistical Methods*, S Chand & Sons,, New Delhi, 2008
4. Saravanavel, P, *Research Methodology*, KitabMahal Agencies, New Delhi, 2005

1. Best JW and Kahn JV, *Research in Education*, Prentice Hall of India Pvt. Ltd., New Delhi, 1996
2. Koul L, *Methodology of Educational Research*, 3rd edition Vikas publishing House Pvt. Ltd ,New Delhi
3. Sadhu A.N and Singh A, *Research Methodology in Social Sciences*, Himalaya Publishing House, Mumbai,

JOURNALS

1. International journal of science and research methodology
2. Journal of teaching and learning research

COURSE OUTCOME:

CO.NO	CO Statement	Knowledge
CO1	Gain knowledge to formulate the research problems based on the methodologies of research and understand the meaning, principles and components of research design	K1
CO2	Demonstrate understanding of ideas and apply skills to outline and determine the usage of appropriate tools of data collection & validity and their suitability in the research setting.	K2
CO3	Apply editing & coding and statistical techniques to process and analyze the data collected and solve the research problem chosen by employing appropriate techniques.	K3
C O4	Examine and analyse the most appropriate method of teaching & learning process and classroom management relevant to higher education to ensure effective student participation	K4
CO5	Determination of the best method of evaluation and testing for internal assessment assessment and student teacher relationship	K5
CO6	Compile the data collected and propose innovative solutions by adopting the necessary steps to complete the research problem selected .	K6

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOMES

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO6
CO1	3	3	2	2	2	3
CO2	3	3	2	2	3	3
CO3	2	3	3	2	2	2
CO4	2	3	3	3	2	2
CO5	2	3	3	3	3	2
CO6	3	3	3	2	3	2
AVERAGE	2.5	3	2.6	2.3	2.5	2.3

KEY : STRONGLY CORRELATED- 3, MODERATELY CORRELATED 2, WEAKLY CORRELATED -1, NO CORRELATION -0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-OHP-LCD), Flipped Learning/Blended Classroom- E Content, Videos, Problem Solving-Group Discussion-Role Modelling, Quiz-Seminar, Peer Learning. Self-Study Papers.

PAPER - II

ADVANCED PAPER IN FOODS AND NUTRITION

TOTAL HOURS: 75 Hours **COURSE CODE: 13M19/APF**
CREDITS: 5

COURSE OBJECTIVES

3. To understand the interrelationship between health and nutrition
4. To apply the techniques of nutrition in research
5. To update the latest techniques in food industry
6. To identify the role of proximate principles in combating non-communicable diseases
7. To equip the students in the application of nutrition through research findings

COURSE OUTLINE

UNIT I: **Nutrition and Immunity:**

Immunity - Review, Goals of immune modulation - phagocytosis, chemotaxis, antigen recognition, immune cell proliferation, maintenance of mucosal barrier; Modulation of inflammatory response; Nutrients with immuno modulating properties - Arginine, Glutamine, Omega 3 fatty acids, sulphur containing amino acids, nucleotides, ornithine, alpha ketoglutarate and taurine; Supplementation, beneficiary effects-Prebiotics Probiotics and symbiotics. (15 HOURS)

UNIT II: **Nutrition, Health and Disease:**

Assessment of nutritional status - current concepts and methods; National Nutrition Policy - Programmes in combating malnutrition in India; Nutrition and drug interaction; Nutrition and behaviour; Recent concepts of fats, protein, available and unavailable carbohydrate in combating non-communicable diseases; Role of antioxidants and phytochemicals, zoo chemicals & herbs. (15 HOURS)

UNITIII: **Techniques in Nutrition Research:**

Principles, procedure and applications of Electrophoresis, Chromatography, Colorimetry, Spectrophotometry, Fluorimetry, Atomic absorption spectrophotometry, Use of auto analyzer, Flame photometer

Microbiological assay, in vitro studies, Radio isotope studies, Animal and Human experimentation, epidemiology – Cross sectional double blind studies (20 HOURS)

UNITIV: **Food Safety, Adequacy and Food allergies:**

Recent developments in food processing and preservation; Post Harvest technology; Novel protein foods - Source, nutritive value and uses; naturally occurring food toxicants and chemical additives in food

Classification of food allergens based on food groups and Nutritional intervention in food allergies. (15 HOURS)

UNIT V: **Macronutrients in Parenteral and Enteral Nutrition**

Parenteral and Enteral nutrition - Review, risk of deficiency, toxicity and adverse effects; Pharmacological use of trace elements - zinc, selenium and copper, chromium, manganese and molybdenum in enteral and parenteral solutions.Drug nutrient interactions(10 HOURS)

REFERENCES

3. Edelstein S, *Lifecycle Nutrition- An evidence based approach*, 2nd edition, Jones & Bartlett learning publications, 2015,
4. Elia M, Ljunggvist O, Stratton RJ, Lanham SA, *Clinical Nutrition (The Nutrition Society Textbook)*, 2nd edition, Wiley Blackwell Publishers, 2013
5. Mahan LK, Stump SE and Raymond JL, *Krause's Food and Nutrition Care Process*, 13th Edition, Elsevier Saunders, Missouri, 2012
6. Stump SE, *Nutrition and diagnosis related care*, 7th edition, Lippincott Williams and Wilkins, Canada, 2012
7. Marian M et al., *Clinical Nutrition for surgical patients*, Jones and Bartlett Publishers, Canada, 2008
8. Joshi Y.K, *Basics of Clinical Nutrition*, 2nd edition, JP Medical Publishers Pvt Ltd, New Delhi, 2008
9. Stacy N, *William's Basic Nutrition and Diet Therapy*, 12th edition, Elseivier publications, UK, 2005
10. **Gibney MJ, Elia M, Ljunggvist O, *Clinical Nutrition (The Nutrition Society Textbook)*** Wiley Blackwell Publishers, **2005**
11. Whitney EN and Rolfes SR, *Understanding Nutrition,* 9th edition, West/Wordsworth, 2002
12. Williams SR, *Nutrition & Diet Therapy*, CV. Mosby St. Louis, 2001
13. Garrow JS, James WPT, Ralph A, *Human Nutrition and Dietetics* 10th edition, Churchill Livingstone, NY, 2000
14. Shils ME, Obson JA, Shike M, *Modern Nutrition in Health and Disease*, Eighth edition, Volume I and II , Lea and Febiger Philadelphia, A Waverly Company, 2000
15. Ruth A., Townsend CE, *Nutrition and Diet Therapy* 8thedition, Thomson Delmar Learning

JOURNALS

3. Journal of American Dietetic Association
4. American Journal of Clinical Nutrition
5. British Journal of Clinical Nutrition
6. Indian Journal of Nutrition and Dietetics
7. European Journal of Clinical Nutrition
8. Nutrition Today
9. Journal of Nutrition and Dietetics
10. Journal of enternal and parenteral nutrition

E-LEARNING SOURCES:

10. www.eatright.org.
11. www.ifcinfo.health.org.

5. www.nutrition.gov
6. www.diabetes.org
7. www.americanheart.org

Course Outcomes

CO No	CO statement	Knowledge level
CO1	Develop the relation between nutrition and immunity through immune modulating agents	K3
CO2	Utilize the techniques involved in nutrition	K3
CO3	Discuss the recent developments in processing, preservation and post harvest technology	K3
CO4	Analyze the current concepts and methods to overcome nutritional deficiency disorders	K4
CO5	Interpret the role of drug interaction with nutrients and nutrition with behaviour	K5
CO6	Formulate parenteral and enteral nutrition feeds using trace elements	K6

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
CO6	3	3	2	2	2	2
AVERAGE	3	3	2.8	2.8	2.8	2.8

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

12. Lecture (Chalk and Talk-OHP-LCD)
13. Flipped Learning/Blended Classroom-E Content, Videos
14. Problem Solving-Group Discussion-Role Modelling
15. Quiz-Seminar
16. Peer Learning
17. Self-Study Papers

PAPER III

ELECTIVE 1 -INTERNAL PAPER ON PRODUCT DEVELOPMENT & NUTRIENT ANALYSIS

Paper Code: 13M19/IE1 **Credits: 5**

This paper should deal in depth, the contours of the research topic undertaken by the candidate with reference to:

- Background research
- Literature review
- Experimental Design
- Development, standardization and experimentation Parameters and procedures used
- Quantitative and qualitative analysis
- Interpretation of results
- Inferences, conclusions and recommendations

*Internal Valuation Only

PAPER III

ELECTIVE 2-INTERNAL PAPER ON NUTRITIONAL SURVEY, ASSESSMENT, SUPPLEMENTATION AND COUNSELLING

Paper Code: 13M19/IE2 **Credits: 5**

This paper should deal in depth, the contours of the research topic undertaken by the candidate with reference to:

- Defining the problem
- Literature Survey
- Designing the study
- Screening and selection procedures
- Parameters and tools of data collection
- Measurement and analysis of data
- Interpretation of results
- Drawing conclusions and recommending suggestions

*Internal Valuation Only

PAPER IV
DISSERTATION

Paper Code: 13M19/PRO **Credits: 21**

Dissertation assessment is done based on the following criteria: (100 marks)

8. Originality
9. Literature Survey
10. Research Design
11. Data Collection & Methodology
12. Data Interpretation
13. Report Writing
14. Significant Conclusions/ Contribution to Community or existing research base

CA: (50 marks)
Viva voce: (50 marks)

REFERENCES:

6. Singh, Y.K, *Fundamental of Research Methodology and Statistic*. New Age International (P) Ltd., Publishers. New Delhi, 2015
7. Kothari, C. and Garg, G, *Research methodology Methods and Techniques* 3rd edition, New Delhi: New Age International (P) Ltd, 2014
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