PERIYAR UNIVERSITY

SALEM - 636 011

M.Phil and Ph.D DEGREE
FOOD SCIENCE AND NUTRITION

REGULATIONS AND SYLLABUS

(Effective from the academic year 2012-2013 and thereafter)

PERIYAR UNIVERSITY, SALEM-11
M.Phil and Ph.D FOOD SCIENCE AND NUTRITION

Regulations and syllabus with effect from the academic year (2012-2013)

Objectives of the Course

The main objective of this course is

- to mould student's skills and individuality in Food Science and nutrition research.
- to motivate students to build a bridge between nutrition research and community development.

Eligibility for admission

Candidates who have qualified for post graduate degree in Food Science and Nutrition, Foods and Nutrition, Food Service Management and Dietetics, Applied Nutrition, Food Technology, Food Processing, Food Engineering, Medicine, Agriculture, Home Science, Biochemistry and Catering Science and Technology approved by the Association of Indian Universities are eligible to register for the Degree of Master of Philosophy (M.Phil) and Doctor of Philosophy (Ph.D) in Food Science and Nutrition.

For full – time M.Phil or Ph.D registration, candidates shall be required to have obtained a minimum of 55% marks in PG or M.Phil programme. In case of teacher or others registering for part – time M.Phil or Ph.D candidates belonging to SC/ST community, the minimum percentage of marks for registration is 50%.

Duration

The duration of the M.Phil Course shall extend over a period of one year from the commencement.

Structure of the course

The course of study for M.Phil degree shall consist of (a) Part-I comprising three written papers according to the Syllabus prescribed from time to time; and (b) Part-II Dissertation. Part-I shall consist of Paper-I Nutrition Research Methods and Techniques and Paper-II Advances in Food Science and Nutrition. There shall also be a third paper which shall be the background paper relating to the proposed dissertation.

The course of study for candidates registering for Ph.D with PG qualification have to pass the qualifying examinations (Paper I - Nutrition Research Methods and Techniques; Paper II – Advances in Food Science and Nutrition): The syllabus content of the above two courses similar to that of existing M.Phil programme.

Scheme of Examination for M.Phil degree

Part-I Written Examination: Papers I, II & III

The examination of papers I, II & III shall be held at the end of the year. The duration for each paper shall be 3 hours carrying a maximum of 100 marks.

The exiting pattern of three Papers for M.Phil Programme, ie., Paper I, II and Paper III (guide paper) continue as such.

1. The allotment of marks for (i) theory (ii) Dissertation and viva voce are as follows.

   (i) Theory Papers
   Internal : 25 Marks
   External : 75 Marks
   } = Total Marks =100

   (ii) Project Dissertation
   Dissertation : 150 Marks
   Viva voce : 50 Marks
   } = Total Marks =100

2. The following procedure to be adopted to award internal mark

(i) Seminar : 10 Marks
(ii) Test : 10 Marks
(iii) Attendance : 05 Marks

3. The following credits were allotted to the theory Papers and Project

Credit for theory Papers

Part –I

Paper –I -------- 1X4 = 4 Credits
Paper –II -------- 1X4 = 4 Credits
Paper –III -------- 1X4 = 4 Credits
(Guide Paper)

Part – II

Project – Dissertation and Viva voce = 12 Credits
(Dissertation :8 Credits Viva voce : 4 Credits)

4. The Viva-voce from this academic year (2008-2009\) onwards to be conducted with the following Members.
   (i) HOD –Member of the Viva Board
   (ii) Guide – Chairman of the Viva Board
   (iii) External examiner from other University area – Member of the Board of Valuation
   (iv) a. For Colleges:-
   External Examiner from other Colleges
   Affiliated by Periyar University - Member of the Viva Board
   b. For University Departments :-
   External Examiner from other University area - Members of the Viva Board

5. The paper III (Guide paper) will be commonly conducted by the University to all the colleges along with papers I & II
6. The respective research guide should send two sets of question papers for III paper along with the syllabus to the University at an early date.
7. Double valuation procedure will be adopted for the III paper. One by the respective guide and the other by the external examiner, preferably the Viva –voce examiner
8. The following question paper pattern will be adopted .

Part A 5X5 = (25 marks)
(Internal choice)

Part A 5X10 = (50 marks)
(Internal choice)

Part II- Dissertation

The exact title of the Dissertation shall be intimated within one month after the completion of the written examination. The students will not be permitted to make any changes in the title after completing the paper III examination. Candidates shall submit the Dissertation to the University through the Supervisor and Head of the Department at the end of the year from the commencement of the course which shall be valued by internal examiner (supervisor) and one external examiner appointed by the

University from a panel of four names sent by the Supervisor through the Head of the Department at the time of submitting the dissertation.

The examiners who value the Dissertation shall report on the merit of candidates as " Highly Commended" (75% and above) or "Commended" (50% and above and below 75%) or "Not Commended" (below 50%).

If one examiner commends the Dissertation and the other examiner, does not commend, the Dissertation will be referred to a third examiner and the third valuation shall be final.

Submission or resubmission of the Dissertation will be allowed twice a year.

Passing Minimum

A candidate shall be declared to have passed Part-I of the examination if he/she secures not less than 50% of the marks in each paper including Paper –III for which examination is conducted internally.

A candidate shall be declared to have passed Part-II of the examination, if his/ her dissertation is atleast commended.

All other candidates shall be declared to have failed in the examination. All other parts of general rules for M.Phil

M.Phil FOOD SCIENCE AND NUTRITION
PART I SYLLABUS
Paper I - Nutrition Research Methods and Techniques

SUB CODE: 12MPFSN01 **HOURS**: L + T+P=C

MARKS : 100 4+ 0+ 0=4

UNIT-I

Types of nutrition research studies- longitudinal, cross sectional, epidemiological, surveillance, retrospective, *IN VIVO, IN VITRO* and experimental. Animal nutrition experiments-principles, methods, applications and ethics. Problem selection –factors to be considered, types of variables, Research design in survey and experimental studies-examples in nutrition and health.

UNIT II

Data collection

1. **Quantitative tools**

1.Direct parameters – anthropometry, dietary survey, clinical, bio chemical and immunological tests, growth monitoring tests, body composition tests and physical fitness tests, intelligence test, mental ability tests.

2. Indirect parameters – vital statistics, population tests, socio-economic Indices and KAP surveys.

2. Qualitative research tools

1. Types of interviews
2. Focus group discussions
3. Free listing and pile sorting
4. Narrative
5. Case studies
6. Participatory methods
7. Scaling Techniques
8. SWOT Analysis
9. Social mapping
10. Observations
11. Rapid assessment procedures

4. Reliability and validity of data gathering /measuring instruments

5. Planning and implementation of a nutritional assessment survey.

UNIT-III

Sampling methods, testing hypothesis and data analysis –uses of the following with examples of nutrition and health data:

1. Descriptive statistics – mean median, mode, percentile, t-test, chi-square test, F- test, Correlation and regression.
2. Non- parametric statistics in nutrition research.

3. Uncertainties in nutrition and health research- source, measurement, probability and methods to minimize impact.

UNIT-IV

Organization, Representation and Interpretation of data and report writing, parts of dissertation/thesis. Different forms of scientific writing –Articles in journals, research notes and reports, review articles, monographs, dissertations, bibliographies and writing for grants. Nutrition expert systems

UNIT-V

Principles and applications of various analytical techniques available for nutrition research – colorimetry, photometry, flourimetry, flame photometry, atomic absorption spectrophotometry, Chromatography, Electrophoresis, infrared spectrometry and Bioassays – animal studies, human studies, microbiological assays. Instrumental measurement of viscosity, consistency rhelogical properties, texture, specific gravity, freezing point, melting point, refractive index, gel strength, Brix, densitometry, refractometry, polarimetry, color, RH and water activity.

Reference:

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2. Hendrick, T.E, Bickmath and Rog, D.J. (1993), Applied Research Design – A Practical Guide,California, Sage Publications. Ine.
3. Miles, M.B and Huber man, A.M, (1994), Qualitative Data Analysis- An Expanded Source Book, 2nd Edition, California, Sage Publications. Inc.
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5. Dumm Olive Jean Virginsand Clark A. (1990), Applied Statistics, John Wiley and Sons.
6. Snedecor, G.W. (1992), Statistical Methods, The Iowa State University Press, Iowa.
7. Delbert, C and Miller (1991), Handbook of Research Design and Social Measurement, 5th edition, Sage Publications, New Delhi.
8. S.S.Khanka- (2004), Entrepreneurial Developments, S. Chand publications.
9. Saravanavel,P. (2003), Entrepreneur Development, FSS Peekay Publishing company.
10. Kothari, C.R (2004), Research methodology, methods & Techniques, II edition, New Age International Pvt.Ltd. Publishers.
11. Gurumani, N.(2004),An Introduction to Biostatistics, 1st edition, MJP publishers, Chennai.
12. Gupta, S.P (2004), Statistical Methods, 33rd revised edition, Sultan Chand & Sons educational Publishers, New Delhi.
13. Scrimshaw, N.S. and Gleason, G. R. (1992); Rapid assessment procedures, Qualitative methodologies for planning and evaluation of health related programmes, International Nutrition Foundation for developing countries, Boston.

14. Pomeranz, y. and Meloan, C.E. (1996), Food Analysis: Theory and practice, 3rd edition., CBS publishers and distributors, New Delhi.

Practical related Experience

1. Data analysis using statistical software
2. Workshop / training on handling of advanced analytical instruments in Food Science and Nutrition research
3. Training on writing manuscript for a journal

Paper II - Advances in Food Science and Nutrition

SUB CODE: 12MPFSN02 Hours=L+T+P=C
Marks :100 4+0+0=4

UNIT-I

Advances in Food Science and chemistry: Water and ice- structure and properties, water activity and storage life of foods, phase transition of foods containing water, water – solution interactions, Mass transfer operations - properties of air – water vapor mixture, Humidification and dehumidification operations; physico – chemical and functional attributes of food components (Carbohydrate, lipids, proteins, vitamins, minerals, colours, flavours, acidulants and others) in relation to food quality.

UNIT-II

Advances in food processing technology: Principles , Instrumentation and applications of ultrasound processing, controlled atmospheric and modified atmospheric storage , pulsed electric fields, high intensity light, high pressure processing magnetic Resonance, hurdle technology, nanotechnology in processing and packaging of foods, modeling in processing and storage and edible coating technology.

UNIT-III

Food biotechnology and safety: Nutrigenomics and nutrigenetics, genetically modified foods, Biotechnological intervention in nutrition transition, biotechnology and food safety. Non nutritional food components with potential health benefits – polyphenols, tannins, phytate, phytoestrogens, cyanogenic compounds, lectins, saponins and neutricentical compounds.

UNIT-IV

Special Nutrition: Nutrition during physical activity and exercise - Energy - systems involved in physical activity, Exercise and thermo genesis, role of carbohydrate, fat and protein as a fuel for exercise, fluid and electrolyte balance during prolonged exercise; dietary intake before, during and after exercise; sports nutrition, nutrition in space, defence, high altitudes, low temperatures, and submarines. Nutritional and exercise regimes for management of obesity, diabetes, CV disorders, bone health and cancer, , nutrition in critical care – stress, trauma , sepsis, burns, surgery, dialysis, transplant, and multiple organ failure, Nutrition and mental health.

UNIT-V

Public Health Nutrition: Concept of health and nutrition, role of nutritionists in the health care delivery, nutrition transition, evolution of nutrition, nutritional and non-nutritional indicators of nutritional status, nutritional mapping and surveillance, major nutritional problems in India – macro and micronutrient deficiencies, life style related diseases, other nutritional problems like lathyrism, alcoholism, fluorosis and chronic degenerative diseases; approaches and strategies for improving nutritional status of the community, policy analysis and evaluation, Role of IEC (Information, Education and communication) in improving health and nutrition of a community; Food and nutrition security in India; public nutrition approach to tackle nutritional problems in emergencies.

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5. Shills., et al(1994),Modern Nutrition, in Health &Disease, ,vol I& II, CRC press,8th edition.
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11. Seema Yadav (2002), A textbook of Nutrition and Health, Anmol Publications pvt. Ltd, First edition.
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13. Sadasivam, S. and Manickam, A. (2003), Biochemical methods, New Age International publishers, second edition.
14. James, L. Groff and sareen, S. Gropper,(1999), Advanced Nutrition and Human metabolism, Wadsworth Thomson Learning, Canada.
15. Carolyn, D. Berdanier (2000), Advanced Nutrition - Macronutrients, CRC press publications, second edition.