PERIYAR UNIVERSITY
Periyar Palkalai Nagar, Salem-636011

DEPARTMENT OF FOOD SCIENCE AND NUTRITION

M.Phil and Ph.D DEGREE
FOOD SCIENCE AND NUTRITION
[Choice Based Credit System (CBCS)]

REGULATIONS AND SYLLABUS
(Effective from the academic year 2014-2015 and thereafter)

M.Phil and Ph.D Food Science and Nutrition

Regulations and syllabus with effect from the academic year (2014-2015)

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 Technology, Food Processing, Food Engineering, 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 registration, candidates shall be required to have obtained a minimum of 55% marks in PG or M.Phil programme. The 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/Thesis. Part-I shall consist of Paper-I: 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 research.

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) Dissertation

   Dissertation : 150 Marks
   Viva voce : 50 Marks
   Total Marks =200

   The following procedure to be adopted to award internal mark

   (i) Seminar : 10Marks
   (ii) Tests : 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 to be conducted with the following Members.
   (i) HOD –Member of the Viva Board
   (ii) Guide – Chairperson of the Viva Board
   (iii) External examiner– Member of the Board of Valuation

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 B 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 programme is applicable henceforth or modifications in rules and regulations.

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

SUB CODE: 14MPFSN01 **HOURS**: L +T+P=C
MARKS : 100 4+1+3+=8

Objectives

1. To gain updated knowledge on research design, data analysis, analytical techniques, publication and copyright related to Food Science and Nutrition discipline.

UNIT I

Research design in Food Science and Technology – Food sampling techniques for analysis and product development, sample preparation for various analysis, standardization and portion control, Extraction and Isolation of specific compounds in food – starch, protein, fat, phytochemicals and Nutraceutical compounds, research design- factorial design, randomised block design, central composite rotatable design, techno-economic feasibility analysis, Rapid Assessment Procedures, modeling and computer simulation studies, *in vitro* and *in vivo* methods of testing bioavailability of nutrients, Acute and chronic toxicity studies.

UNIT-II

Research design in Nutritional Science – Problem identification and idea generation, selection of a problem, hypothesis formulation, research design in descriptive surveys and experimental research, sampling techniques, research tools- Quantitative and Qualitative, Reliability and validity of data gathering / measuring instruments. Nutritional mapping and surveillance. Food security status assessment process.

UNIT-III

Statistics – Descriptive Statistics, testing of hypothesis – parametric and non – parametric tests, Computer aided software in statistical calculation - Ms Excel based, SPSS, Organization and representation of data, Ethics in research.

UNIT-IV

Report writing – types of report, parts of report, preparation of project proposal for funding support. Publication / knowledge dissemination - different forms of scientific writing, ISBN and ISSN numbering, citations, Indexing, Impact factor, IPR and patenting, public appraisal techniques for knowledge dissemination.

UNIT-V

Principles and applications of various analytical techniques – colorimetry, photometry, flourimetry, flame photometer, atomic absorption spectrophotometer, chromatography, electrophoresis, infrared spectrometry, X-Ray diffractometer, microscopes, viscometer, rheometer, texture analyser, densitometer, refractometer, penetrometer, hydrometer, hunter color lab, water activity meter.

Practical Experiences

1. Two days Workshop on “SPSS Packages in food and Nutritional sciences”
2. Two days Workshop on Food Science and Nutrition Research methods.
3. Training on utilization of e- resource, journal numbering, citations of an article, indexing, impact factor calculation through central library of Periyar University.
4. Training on advanced analytical techniques.

Reference:

1. Ghai,O.P, and Gupta, P. (1999) , Essential Preventive Medicine- A Clinical And Applied

Approach.
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.
4. David, G. Alms, Basy., H, Katano, A. Witz and Henry, L. Rcodiger. (1995), Research Methods In Psychology, West Publishing Company New York.
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.

M.Phil FOOD SCIENCE AND NUTRITION
PART I SYLLABUS
Paper II – Advances in Food Science and Nutrition

SUB CODE: 14MPFSN02 **HOURS**: L +T+P=C
MARKS : 100 4+1+3+=8

Objectives

1. To explore research oriented knowledge and entrepreneurial skill on Food Science and Nutrition discipline.

UNIT I

Properties and Quality of food – Principles and methods of determination of physical, functional, chemical, nutritional, thermodynamic, mass – transfer, kinetic, microbiological and sensory properties of food. Food'omics' – metabolomics, proteomics and nutrigenomics.

UNIT-II

Food value chain – Origin of food, production trend, post harvest technology- from farm yard to consumer table, shelf life of a product, packaging material and systems, labeling, food processing industries in World and India, food industrial by products and waste management.

UNIT-III

Food safety and regulations - Anti nutritional factors, contaminants and toxic elements in food, food additives, food laws and regulations- National and International laws and legislations, food safety management tools, consumer protection procedures, laws and regulations, food safety testing kits and rapid diagnostic procedures.

UNIT-IV

Special Nutrition – Nutrition in exercise, sports, space, defense, high altitudes, low temperatures, submarines. nutrition and diet in common deficiency disorders, nutrition and diet in common diseases / disorders, nutrition in critical care – pre and post operative diets, nutrition and behaviors, role of Nutraceutical and functional components in health claim.

UNIT-V

Public Health Nutrition – Evolution of nutrition, nutrition transition, nutritional and non-nutritional indicators of nutritional status of a community, food security status in India, systems, policies and organization deliverables of food and nutritional security in India. Nutrition in emergencies.

Practical experience

1. Training on food safety and quality control by FSSAI personnel.
2. Field visit to public health department to study its functional and current status.
3. Visit to food processing industries.
4. Any one entrepreneurship programme.

References

1. Coultate, T.P (1999), Food : the chemistry of it's components, The Royal society of chemistry, Cambridge
2. Belitz, H.D. and Grosch, W. (1999), Food Chemistry, 2nd edition, Springer Verlag Heidelberg.
3. Pauline. Paul & Helen, H. palmer.(1997), Food theory and applications, john Wiley& sons
4. Okoye, Z.S.C, (1992), Biochemical Aspects of Nutrition. Prentice –Hall of India,

pvt Ltd. Eastern Economy Edition.

5. Shills., et al(1994),Modern Nutrition, in Health &Disease, ,vol I& II, CRC press,8th edition.

6. Deb, A.C. (1999) Fundamentals of biochemistry, New central book agency(P) Ltd, Calcutta
7. Meera Rao Patankar and Pushpa Bharathi (2001), Food preparation and Scientific approach, Anmol publications pvt ltd, 1st edition.
8. Rick Parker (2002), Introduction to Food Science, library of congress cataloging – in-publication data, First edition.
9. Thomas Richardson and John Finely (2003), chemical changes in food during processing, CBS publishers and distributors, New Delhi, Reprint.
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12. Mangala Kango (2003), Normal Nutrition- (Fundamentals and management), RBSAS publishers, First edition.
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.