M.Sc. Home Science
Syllabus 2016
Foods and Nutrition

The specialists in Foods and Nutrition play a vital role in promoting the quality of life of individuals and communities, which contributes significantly to the economic and overall development of the nation. This is achieved through a blend of academics, research training and extension as well as industrial applications. The post graduate programme in this discipline has been designed to provide the students with intensive and extensive theoretical and experiential learning. The programme allows flexibility in the choice of thrust areas, which students can select, based on their career goals. It is envisaged that the current scenario at the regional and national level require trained professionals in areas such Food processing and Technology, Food analysis, Clinical and Therapeutic Nutrition, Institutional Food Administration, Food Science, Food Safety, Food Toxicology and Quality Control.

Aim of the Programme
The curriculum integrating several elective courses, besides the core, has been formulated to provide professionally competent manpower for
a. Academic and research activities
b. Hospitals, food service institutions and industries
c. Managerial roles in agencies and institutions both Government and NGO sector.
d. Planning, monitoring and evaluation of nutrition and health programmes
e. Training and IEC activities of regional and national programmes
f. Ensuring food safety and quality for consumers
g. Entrepreneurial ventures
h. Advocacy and consultancy

Eligibility for Admission
The candidates should have completed Food and Nutrition at B.Sc. level with a minimum percentage of marks decided by the University time to time.
Note: It is a full time degree course and therefore cannot run part time or as external. The contact hour is minimum five hours including practical should be given to the student if it is run by the P. G. Department or any other centre. A total of 96 credits have to be taken by the students to complete the programme. If the number of credits exceeds 96, it permissible, but the calculation of the grade point average will be done on the basis of 96 credits only.

DURATION OF THE COURSE

Two years Courses: The duration of the course is for two academic years consisting of four semesters.

EXAMINATIONS

There shall be four semester examinations: first semester examinations at the middle of the first academic year and the second semester examination at the end of the first academic year. Similarly, the third and fourth semester examinations shall be held at the middle and the end of the second academic year, respectively. The courses are divided into two parts among one is internal consists of 30 marks for core, skill oriented and multidisciplinary courses and 15 marks for elective courses and external consists of 70 marks for core, skill oriented and multidisciplinary courses and 35 marks for elective courses. Internal marks are further divided into three parts among one is MCQ test of 10 marks for CC, MD and SO while 5 marks for elective which is conducted during middle and end of each semester and average of two is consider as a final score. 10 mark of assignment for CC, MD and SO while 5 marks for elective. 10 mark of seminar for CC, MD and SO while 5 marks for elective. Course contain practical works is exempted from seminar.

PATTERN OF QUESTION PAPER: For theory

For 4 credit course, question paper will be of 2.5 hours duration.
Question paper will contain total six questions.
Question No-1 or Question No. 1 will be compulsory and objective type.
Students will have to attempt any three questions from the rest of the questions.
All Questions will carry equal grades.
For 2 credit course, question paper will be of 1.5 hours duration.
Question paper will contain total four questions.
Question No-1 or Question No. 1 will be compulsory and objective type.
Students will have to attempt any two questions from the rest of the questions.
All Questions will carry equal grades.
For practical

For practical examination a skeleton will be designed and given to examiner every year. The duration will be of five hours. Passing standard is 40%.

EVALUATION

The seven grade point scale starting from 'O' to 'F' will be formed for evaluation of theories and Practicals.

The student will be required to obtain at least 'C' grade (i.e. minimum of 2.6 grade points) in individual theories and practical for passing. For passing theories and practicals should be considered separately.

Before getting the final average grade point (AGP), the student will have to clear all theory and practical subjects i.e. at least 2.6 grade points in each theory and practicals.

For calculating the semester grade point, the average of grade of each theory subject and each practical subject will be considered. The final semester grade will be given on the basis of obtained grade points as per the scale.

For calculating the final grade point at the end of four semesters, the average of semester grade points will be considered. The final grade will be given on the basis of obtained final grade point as per the scale.

- The grade point scale is as follows:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Grade</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>O-Outstanding</td>
<td>5.6 – 6.0</td>
</tr>
<tr>
<td>2</td>
<td>A-Very Good</td>
<td>4.6 – 5.5</td>
</tr>
<tr>
<td>3</td>
<td>B-Good</td>
<td>3.6 – 4.5</td>
</tr>
<tr>
<td>4</td>
<td>C-Average</td>
<td>2.6 – 3.5</td>
</tr>
<tr>
<td>5</td>
<td>D-Fair</td>
<td>1.6 – 2.5</td>
</tr>
<tr>
<td>6</td>
<td>E-Poor</td>
<td>0.6 – 1.5</td>
</tr>
<tr>
<td>7</td>
<td>F-Very poor</td>
<td>0.0 – 0.5</td>
</tr>
</tbody>
</table>

- For calculating average percentage the average grade point should be multiplied by 16.67.

- Dissertation must be in English Language only.
Blue print of M.Sc. Foods & Nutrition Programme

Semester-1: Foods & Nutrition

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title of The Course</th>
<th>CC</th>
<th>CCr</th>
<th>WH</th>
<th>IM</th>
<th>EM</th>
<th>TM</th>
</tr>
</thead>
<tbody>
<tr>
<td>16081202010100</td>
<td>Research Methods</td>
<td>MD</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102010200</td>
<td>Advanced Nutritional Biochemistry</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Advanced Nutritional Biochemistry (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16080102010300</td>
<td>Methods of Investigation</td>
<td>SO</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Methods of Investigation (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16081202010401</td>
<td>Geriatric Nutrition</td>
<td>EL</td>
<td>02</td>
<td>02</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>16080102010402</td>
<td>Public Health Nutrition</td>
<td></td>
<td>02</td>
<td>02</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>16080102010403</td>
<td>Food Packaging</td>
<td></td>
<td>02</td>
<td>02</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>16081202010500</td>
<td>Clinical and Therapeutic Nutrition</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Clinical and Therapeutic Nutrition (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

**Total** 24 30 13 465 600

CC=Course Category, CCr= Course Credit, WH= Working Hours, IM=Internal Marks, EM=External Marks, TM=Total Marks, Course revision year=16, Faculty code=08, Subject code= 01 for Foods & Nutrition, 02 for General Home Science and 12 for common for both, Level=02 (PG), Sem=01-04, Paper no= 01-05, Options 00 for Core, Multidisciplinary (MD), and Skill oriented (SO), for Elective =01-05 (EL)

**Interpretation of code** 16081202010100 Here 16 means 2016, 08 Home science faculty, 12 means this paper is common for foods & nutrition and general home science, 02 means PG level, 01 Semester I, again 01 is paper no and last 00 is for Multidisciplinary course.
## Semester-II: Foods & Nutrition

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title of The Course</th>
<th>CC</th>
<th>CCr</th>
<th>WH</th>
<th>IM</th>
<th>EM</th>
<th>TM</th>
</tr>
</thead>
<tbody>
<tr>
<td>16080102020100</td>
<td>Maternal and Child Nutrition</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102020200</td>
<td>Advanced Nutrition - I</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102020200(P)</td>
<td>Advanced Nutrition – I (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td></td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16081202020300</td>
<td>Food Science</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102020300 (P)</td>
<td>Food Science (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td></td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16081202020401</td>
<td>Nutrition for Health and Fitness</td>
<td>EL</td>
<td>02</td>
<td>02</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>16080102020402</td>
<td>Nutritional Epidemiology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16080102020403</td>
<td>Food product development and Marketing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16081202020500</td>
<td>Statistics</td>
<td>SO</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16081202020500 (P)</td>
<td>Computer Application (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td></td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>24</td>
<td>30</td>
<td>13</td>
<td>465</td>
<td>600</td>
</tr>
</tbody>
</table>

**CC=Course Category, CCr= Course Credit, WH= Working Hours, IM=Internal Marks, EM=External Marks, TM=Total Marks, Course revision year=16, Faculty code=08, Subject code,= 01 for Foods & Nutrition, 02 for General Home Science and 12 for common for both, Level=02 (PG), Sem=01-04, Paper no= 01-05, Options 00 for Core, Multidisciplinary (MD), and Skill oriented (SO), for Elective =01-05 (EL)

**Interpretation of code** 16080102020100 Here 16 means 2016, 08 Home science faculty, 01 means foods & nutrition, 02 means PG level, 02 Semester II, again 01 is paper no and last 00 is for Core course.)
### Semester-III: Foods & Nutrition

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title of The Course</th>
<th>CC</th>
<th>CCr</th>
<th>WH</th>
<th>IM</th>
<th>EM</th>
<th>TM</th>
</tr>
</thead>
<tbody>
<tr>
<td>16080102030100</td>
<td>Institutional Food Administration</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16080102030100 (P)</td>
<td>Institutional Food Administration (Pra)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>02</td>
<td>04</td>
<td>--</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>16080102030200</td>
<td>Advanced Food Microbiology</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102030200 (P)</td>
<td>Advanced Food Microbiology (Pra)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>16080102030300</td>
<td>Advanced Human Physiology</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102030300(P)</td>
<td>Instrumentation for Food Analysis (Pra)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>16081202030401</td>
<td>Dietetic techniques and patient counseling</td>
<td>EL (Anyone)</td>
<td>02</td>
<td>02</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>16080102030402</td>
<td>Management of Nutrition programme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16080102030403</td>
<td>Food Toxicology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16081202030500</td>
<td>Scientific Writing</td>
<td>SO</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>24</td>
<td>30</td>
<td>135</td>
<td>465</td>
<td>600</td>
<td></td>
</tr>
</tbody>
</table>

CC=Course Category, CCr= Course Credit, WH= Working Hours, IM=Internal Marks, EM=External Marks, TM=Total Marks, Course revision year=16, Faculty code=08, Subject code=01 for Foods & Nutrition, 02 for General Home Science and 12 for common for both, Level=02 (PG), Sem=01-04, Paper no= 01-05, Options 00 for Core, Multidisciplinary (MD), and Skill oriented (SO), for Elective 01-05 (EL)

**Interpretation of code 16080102030100** Here 16 means 2016, 08 Home science faculty, 01 means foods & nutrition, 02 means PG level, 03 Semester III, again 01 is paper no and last 00 is for Core course.)
### Semester-IV: Foods & Nutrition

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title of The Course</th>
<th>CC</th>
<th>CCr</th>
<th>WH</th>
<th>IM</th>
<th>EM</th>
<th>TM</th>
</tr>
</thead>
<tbody>
<tr>
<td>16080102040100</td>
<td>Food Processing and Technology</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102040100 (P)</td>
<td>Food Processing and Technology (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16080102040200</td>
<td>Advanced Nutrition – II</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102040300</td>
<td>Food Safety and Quality Control</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102040300 (P)</td>
<td>Food Safety and Quality Control (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16080102040401</td>
<td>Nutrition in Critical Care</td>
<td>EL  (Any one)</td>
<td>02</td>
<td>02</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>16080102040402</td>
<td>Current Trends in Public Nutrition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16080102040403</td>
<td>Current Trends in Foods &amp; Nutrition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16081202040500</td>
<td>Assessment of Nutritional Status</td>
<td>SO</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16081202040500 (P)</td>
<td>Assessment of Nutritional Status (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16081202040500 (D)</td>
<td>Dissertation Of 150 marks instead of 16081202040500 and 16081202040500 (P)</td>
<td>----</td>
<td>----</td>
<td>---</td>
<td>---</td>
<td>50</td>
<td>150</td>
</tr>
</tbody>
</table>

Total: 24 30 135 465 600

CC=Course Category, CCr= Course Credit, WH= Working Hours, IM=Internal Marks, EM=External Marks, TM=Total Marks, Course revision year=16, Faculty code=08, Subject code= 01 for Foods & Nutrition, 02 for General Home Science and 12 for common for both, Level=02 (PG), Sem=01-04, Paper no= 01-05, Options 00 for Core, Multidisciplinary (MD), and Skill oriented (SO), for Elective =01-05 (EL)

(Interpretation of code 16080102040100 Here 16 means 2016, 08 Home science faculty, 01 means foods & nutrition, 02 means PG level, 04 Semester IV , again 01 is paper no and last 00 is for Core course.)
Guideline for Students to select Elective subjects for building their carrier in the field in which they want to built

List of Elective Subjects in M. Sc. Foods & Nutrition Programme

<table>
<thead>
<tr>
<th>Semester</th>
<th>Foods &amp; Nutrition</th>
<th>Related to Food Technology</th>
<th>Related to Public Nutrition</th>
<th>Related to Dietetics</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Food Packaging,</td>
<td>Public Health Nutrition</td>
<td>Geriatric Nutrition</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Food product</td>
<td>Nutritional Epidemiology</td>
<td>Nutrition for Health and Fitness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>development and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marketing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Food Toxicology</td>
<td>Management of Nutrition</td>
<td>Dietetic techniques and patient counseling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>programme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Current Trends in</td>
<td>Current Trends in Public</td>
<td>Nutrition in Critical Care</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Foods &amp; Nutrition</td>
<td>Nutrition</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Detail Syllabus of M.Sc. Home Science

### Foods and Nutrition

*(Syllabus format on CBCS: June-2016)*

**Semester-1: Foods & Nutrition**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title of The Course</th>
<th>CC</th>
<th>CCr</th>
<th>WH</th>
<th>IM</th>
<th>EM</th>
<th>TM</th>
</tr>
</thead>
<tbody>
<tr>
<td>16081202010100</td>
<td>Research Methods</td>
<td>MD</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102010200</td>
<td>Advanced Nutritional Biochemistry</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102010200 (P)</td>
<td>Advanced Nutritional Biochemistry (Pra)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16080102010300</td>
<td>Methods of Investigation</td>
<td>SO</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102010300 (P)</td>
<td>Methods of Investigation (Pra)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16080102010401</td>
<td>Geriatric Nutrition</td>
<td>EL</td>
<td>02</td>
<td>02</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>16080102010402</td>
<td>Public Health Nutrition</td>
<td>(Any one)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16080102010403</td>
<td>Food Packaging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16081202010500</td>
<td>Clinical and Therapeutic Nutrition</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16081202010500 (P)</td>
<td>Clinical and Therapeutic Nutrition (Pra)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total** | 24  | 30  | 13  | 465 | 600 |

CC=Course Category, CCr= Course Credit, WH= Working Hours, IM/Internal Marks, EM=External Marks, TM=Total Marks, Course revision year=16, Faculty code=08, Subject code=01 for Foods & Nutrition, 02 for General Home Science and 12 for common for both, Level=02 (PG), Sem=01-04, Paper no= 01-05, Options 00 for Core, Multidisciplinary (MD), and Skill oriented (SO), for Elective =01-05 (EL)

**Interpretation of code 16081202010100** Here 16 means 2016, 08 Home science faculty, 12 means this paper is common for foods & nutrition and general home science, 02 means PG level, 01 Semester I, again 01 is paper no and last 00 is for Multidisciplinary course.)
SEMESTER – I

FOODS & NUTRITION

PAPER-1

Course Code: 16081202010100  Course Category: Multi-disciplinary

Course Title: RESEARCH METHODS

Credit: 04  Contact hour/week=04

Objectives:

• To understand the significance of statistics and research methodology in Home Science research
• To understand the types, tools and methods of research and develop the ability to construct data gathering instruments appropriate to the research design.
• To understand an
• To apply the appropriate statistical technique for the measurement scale and design.

Unit I: Research- Meaning, purpose and approaches

• Exploration, Description, Explanation
• Scientific method and research
• Research Designs –Experimental and Observational
• Quantitative and Qualitative approaches
• Conceptualization and Measurement Variables, concepts and measurement
• Levels of measurement
• Units of analysis

Unit II: Sampling & Tools

• Role of sampling in research
• Types of sampling
• Research Tools and Techniques Validity and reliability
• Interviewing and observational methods

Unit III: The Research Process

• Defining the problem, research questions, objectives, hypotheses
• Review of related literature and originality in writing
• Planning the research
• Subjects context and ethics
• Methodology and tools
• Citation formats: in medical sciences, social sciences
• Unit III:
  Unit IV: Types of Research Tools (Qualitative and Quantitative)
  • Quantitative research tools
  • Qualitative research tools
  • Focus Group Discussion
  • Case studies
  • Observations-Direct, Spot observations
  • Body mapping
  • Pile sorting
  • Free listing
  • Narrations
  • In depth interview
  • Drawing as dialogue

Unit V: Representation of Data
  • Graphical and Diagrammatic Presentation of Data (Bar diagrams, Pie-diagram, Histogram, Frequency Polygon, Smoothed frequency curve and Ogives)
  • Tabulation and Classification
  • Frequency Distribution

Unit V I: Ethics and Politics of Research
  • Identify, define, and analyze ethical issues in the context of human subject research.
  • Reasons for conducting ethical review of research, theories and concepts related to ethical decision-making including consequentialism, deontology, respect, dignity, discourse ethics, communitarianism, liberalism and the four principles approach.
  • Ethical importance of consent, privacy and confidentiality in research
  • Issues of academic fraud and plagiarism, conflicts of interest, authorship and publication

RECOMMENDED READINGS
• Bhattacharya DK (2004). Research Methodology. Published by Anurag Jain for excel books, New Delhi, India
• Centrey Gofes Company, Inc. New York.
• Delhi, Sultan Chand and Sons.
• Design, Prentice Hale Inc. N.J.
• Good V. Caiter (1972): Essentials of Educations Research Methodology and
• Good C.N. (1963): Introduction to Educational research, New York, Appliantan
• Keennetb King. (1978): Final report Literacy Research in developing countries -
• Ltd., Ramnagar, Delhi.
  New Delhi.
• Patton Q.M. (1990): Qualitative evaluation and Research methods, sage Pub.,
• Ratnapala N. (1993): New Horizons in Research methodology, Sri Lanka,
  John Willy & Sons
  Sarvodaya Research Institute.
  in the Social Sciences. The Scarecrow Press, Inc., New Jersey
• Wandt Edwin (1968): A cross section of educational Research, David Mckay
  workshop on education research with special research on literacy. Geneva
Course Code: 16080102010200  
Course Category: Core  
Course Title: ADVANCED NUTRITIONAL BIOCHEMISTRY  
Credit: 04  
Contact hour/week=04

Objectives

This course will enable the students to:

- Augment the biochemistry knowledge acquired and at the undergraduate level
- Understand the mechanisms adopted by the human body for regulation of metabolic pathways
- Get an insight into interrelationships between various metabolic pathways
- Become proficient for specialization in nutrition.
- Understand integration of cellular level metabolic events to nutritional disorders and imbalances.

Contents

1. **Heteropolysaccharides**: Definition, classification, structure and properties of glycoprotein and proteoglycans.
2. **Plasma Proteins** – Nature, properties and functions
3. **Overview of regulation of intermediary metabolism**: Equilibrium and non-equilibrium reactions, committed steps, allosteric modifications, covalent modulation, cross-over theorem and futile cycles.
4. **Intermediary metabolism**: Reactions, standard free energy changes and regulation.  
   - Carbohydrates – glycolysis, gluconeogenesis, citric acid cycle, hexose monophosphate pathway.  
   - Lipids, beta-oxidation, de novo synthesis of fatty acids, synthesis and breakdown of unsaturated fatty acids, cholesterol, phospholipids and triacylglycerol
5. **Purines and Pyrimidines** – Synthesis and breakdown.
7. **Hormones** – Mechanism of action of hormones.
Objectives:
This course will enable the students to:

- Understand the principles of biochemical methods used for analysis of food and biological samples
- Perform biochemical analysis with accuracy and reproducibility.

1. Calcium: Estimation of calcium in foods and serum.
3. Ascorbic acid: Estimation of ascorbic acid in foods.
4. Proteins:
   b. Estimation of albumin, globulin and albumin / globulin ratio in serum and urine.
   c. Estimation of hemoglobin
5. Glucose: Estimation of glucose in blood and urine.
6. Cholesterol: Estimation of cholesterol in blood
7. Enzyme assay: Estimation of activity of serum alkaline phosphatase and transaminase
9. Survey of pathological laboratories: To obtain information about the methods used for blood / serum analysis.

References:
Course Code: 16080102010300                        Course Category: Skill Oriented

Course Title: Methods of Investigation

Credit: 04                        Contact hour/week=04

Objectives:

This course will enable the students to:

• To understand the principles of various analytical techniques available for nutrition research.
• To familiarize with the applications of the above techniques.

Contents

1. **Introduction to method of analysis**: volumetric analysis, standard substance and solutions, calibration of glasswares, standardization of solutions with examples.
2. **Electrolytic dissociation**: Acids, bases, salts, buffers, Henderson – Hasselbach equation. Theory of indicators and principles of measurement of pH
3. **Basics of Instrumentation**: Physico-chemical principles and methodology: colorimetry, photometry, fluorimetry, flame photometry and atomic absorptiometry.
4. **Chromatography**: Principles and application in paper (circular, ascending and descending), ion-exchange, column, thin layer, gas liquid and high performance liquid chromatographic techniques.
5. **Electrophoresis**: Principle and applications in paper and gel electrophoresis.
6. **NMR and its application**.
7. **Immunological Methods**: RIA, ELISA.
Course Code: 16080102010300P  Course Category: Skill Oriented

METHODS OF INVESTIGATION Practical

Credit: 02  Contact hour/week=04

Objectives

This course will enable the students to:

1. Orient them regarding the use of various analytical techniques for specific estimation.
2. Comprehend better the principles involved in different methods of investigation.
3. Become efficient in the use of some of the most commonly used techniques and instruments in High quality research.

1. **Acid and Alkalis**: Preparation of dilute solutions of common acids and alkalis and determining their exact normalities.

2. **Buffers**: Preparation of phosphate, carbonate-bicarbonate, boric acid, acetate, chloride and phthalate buffers and determination of their pH by the use of indicators and pH meters.

3. **Spectrometry**: Beer Lambert law, absorption maximum, preparation of standard curve and nutrient estimations in UV and visible range, AAS, AES, Flamephotometry.

4. **Fluorimetry**: Estimation of thiamin and riboflavin.


6. **Electrophoresis**: Fractionation of plasma proteins.

References

Course Code: 16080102010401  
Course Category: Elective

Course Title: Geriatric Nutrition

Credit: 02  
Contact hour/week=02

Objectives:

The course is designed to:

- Familiarize the students with the multifaceted aspects of ageing.
- Make the students competent for nutritional and health care of the elderly.

Contents

1. The ageing process-physiological, biochemical and body composition changes.
2. Theories of ageing.
4. Nutritional requirements of the elderly and dietary management to meet nutritional needs
5. Chronic degenerative diseases and nutritional problems of the elderly – their etiopathogenesis, management, prevention and control.
6. Policies and programmes of the government and NGO sector pertaining to the elderly.

References

Course Code: 16080102010402  
Course Category: Elective

Course Title: Public Health Nutrition

Credit: 02  
Contact hour/week=02

Unit-I

Concept of public nutrition - Relationship between health and nutrition, role of public nutritionists in the health care delivery system.

UNIT -II

Approaches and strategies for improving nutritional status and health - Programmatic options their advantages and demerits. Intervention Programmes Health based interventions, Food based interventions including fortification and genetic improvement of foods, supplementary feeding. Malnutrition and Health economics - Its impact on productivity and national development. Cost management.

UNIT -III

Information Education Communication approaches to improve health and nutrition: Concepts Scope- Elements- Models of communication - Communication Process - Approaches and Barriers to communication, Communication for Extension Education and Development - Introduction to IEC Aims and Objectives, Importance of IEC, relevance to programmes - Nutrition education for behaviour change Rationale, Planning Execution and evaluation - Intervention Programmes Health based interventions, Food based interventions including fortification and genetic improvement of foods, supplementary feeding- Different Media, their characteristics and use- IEC for different target groups.
References

3. SCN News, UN ACC/SCN Subcommittee on Nutrition.
5. Census Reports.
19. Documents and Reports published by the International Vitamin A Consultative Group
20. Documents and Reports of the International Nutritional Anemia Consultative Group
Course Code: 16080102010403  
Course Category: Elective  
Course Title: Food Packaging  
Credit: 02  
Contact hour/week=02

Objectives:
This Course is designed to enable students to:

- Gain knowledge about various packaging materials and importance of packaging.
- Be familiar with testing and evaluation of packing media.
- Be familiar with packaging laws and regulations.
- Be able to select appropriate packaging material for a variety of food stuffs vis-à-vis the need for preventing environment degradation.

Contents

1. **Introduction to packaging:** Primary packaging media, Properties and application manufacturing and applications of paper and paperboard, metal, glass, plastics; combined package systems; Labels, caps and closures and adhesives, inks and lacquers, cushioning materials.

2. **Packaging of Food products:** fruits and vegetables; packaging requirements of fresh fruits and vegetables; criteria for selection of proper packaging based on the shelf life desired.

3. **Environmental and safety issues in packaging:** Packaging Laws and regulations, Coding and marking including bar coding; Environmental & Economic issues, recycling and waste disposal.

REFERENCES

3. Stanley & Sacharow Food Packaging.
7. Robertson, G. L. Food Packaging - New York, Marcell Dekker, INC.
Course Title: CLINICAL AND THERAPEUTIC NUTRITION

Credit: 04  
Contact hour/week=04

Objectives:

This Course will enable students to:

- Understand the etiology, Physiologic and Metabolic Anomalies of acute and chronic diseases and patient needs.
- Know the effect of the various diseases on nutritional status and nutritional and dietary requirements.
- Be able to recommend and provide appropriate nutritional care for prevention / and treatment of the various diseases.

Contents

1. Obtaining medical & dietary history of patients.
3. Etiopathophysiology, metabolic and clinical aberrations, complications, prevention and recent advances in the medical nutritional management of:
   - Weight imbalances
   - Cardio vascular disorders
   - Diabetes mellitus and other metabolic disorders.
   - GI Tract Disorders
   - Liver and gall bladder, Pancreatic disorders
   - Renal disorders
   - Stress and trauma
   - Cancer
   - Infection AIDS
   - Respiratory problems
Clinical and Therapeutic Nutrition

Practicals

Credit: 02

Contact hour/week=04

1. Market survey of commercial nutritional supplements and nutritional support substrates.
2. Interpretation of patient data and diagnostic tests and drawing up of patient diet prescription, using a case study approach. Follow-up acceptability of diet prescription compliance; discharge diet, plan for cardiovascular disease diabetes. Liver, Renal diseases.
3. Preparation of diet counseling aids for common disorders.
4. Planning and preparation of diets for patients with common multiple disorders and complications and discharge diet plans.

References:


Journal and Other References Series:
14. Nutrition Update Series
15. World review of nutrition and dietetics.
16. Journal of the American Dietetic Association
17. American Journal of Clinical Nutrition
18. European journal of Clinical Nutrition
19. Nutritional reviews.
**Detail Syllabus of M.Sc. Home Science**

**Foods and Nutrition**

*(Syllabus format on CBCS: June-2016)*

**Semester-II: Foods & Nutrition**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title of The Course</th>
<th>CC</th>
<th>CCr</th>
<th>WH</th>
<th>IM</th>
<th>EM</th>
<th>TM</th>
</tr>
</thead>
<tbody>
<tr>
<td>16080102020100</td>
<td>Maternal and Child Nutrition</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102020200</td>
<td>Advanced Nutrition - I</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102020200(P)</td>
<td>Advanced Nutrition – I (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16081202020300</td>
<td>Food Science</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102020300 (P)</td>
<td>Food Science (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16081202020401</td>
<td>Nutrition for Health and Fitness</td>
<td>EL (Any one)</td>
<td>02</td>
<td>02</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>16081202020402</td>
<td>Nutritional Epidemiology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16081202020403</td>
<td>Food product development and Marketing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16081202020500</td>
<td>Statistics</td>
<td>SO</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16081202020500 (P)</td>
<td>Computer Application (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

**Total** | 24 | 30 | 13 | 5 | 465 | 600 |

CC=Course Category, CCr= Course Credit, WH= Working Hours, IM=Internal Marks, EM=External Marks, TM=Total Marks, Course revision year=16, Faculty code=08, Subject code= 01 for Foods & Nutrition, 02 for General Home Science and 12 for common for both, Level=02 (PG), Sem=01-04, Paper no= 01-05, Options 00 for Core, Multidisciplinary (MD), and Skill oriented (SO), for Elective =01-05 (EL)

*(Interpretation of code) 16080102020100 Here 16 means 2016, 08 Home science faculty, 01 means foods & nutrition, 02 means PG level, 02 Semester II, again 01 is paper no and last 00 is for Core course.)*
Course Code: 16080102020100 Course Category: Core
Course Title: Maternal & Child Nutrition
Credit: 04 Contact hour/week=04

Objectives:
This course is designed to enable the students to:

- Understand physiological changes in pregnancy and lactation.
- Get acquainted with growth and developmental changes.
- Understand the inter-relationship between nutrition and growth and development during life cycle.

Contents
1. Importance of Maternal Nutrition:
- Importance of nutrition prior to and during pregnancy.
- Pre-requisites for successful outcome. Effect of undernutrition on mother and child including pregnancy outcome and Maternal and Child Health – Short term and Long term.
- Physiology and endocrinology of pregnancy and embryonic and fetal growth and development.
- Nutritional requirements during pregnancy
- Adolescent Pregnancy
- Pregnancy and AIDS
- Pregnancy and TB
- Intra-Uterine growth retardation
- Complications of pregnancy and management and importance of antenatal care.
- Congenital malformation, fetal alcohol syndrome and gestational diabetes mellitus.

2. Lactation:
- Development of mammary tissue and role of hormones
- Physiology and endocrinology of lactation – Synthesis of milk components, let down reflex, role of hormones, lactational amenorrhea, and effect of breast feeding of maternal health.
• Human milk composition and factors affecting breastfeeding and fertility
• Management of lactation – Prenatal breastfeeding skill education. Rooming in, problems – sore nipples, engorged breast, inverted nipples etc.
• Exclusive breastfeeding

3. Growth and development during infancy, childhood.

References

2. International Child Health: A Digest of Current Information.
10. ACC / SCN Reports.
Course Code: 16080102020200

Course Title: Advanced Nutrition-I

Course Category: Core

Credit: 04

Contact hour/week=04

Objectives:

This course is designed to:

- Provide in-depth knowledge of the physiological and metabolic role of various nutrients and their interactions in human nutrition.
- Enable students to understand the basis of human nutritional requirements and recommendations through the life cycle.
- Enable students to understand the pharmacological actions of nutrients and their implications.
- Familiarize students with recent advances in nutrition.

Contents


Course Title: Advanced Nutrition-I Practical

Credit: 02 Contact hour/week=04

Objectives

The aim of the course is to:

1. Familiarize students with basic techniques used in Studies and Research in Nutritional Sciences.
2. Acquaint students with the methods of estimating nutrient requirements.
3. Orient students towards planning of metabolic studies.

Contents

1. Estimation of Protein Quality using different methods PER, B.V, N.P.U., ND.P-Cal %.
2. Estimation of energy value of foodstuffs using bomb calorimeter.
3. Estimation of Energy Requirements:
   - BMR
   - Energy expenditure on physical activities.
   - Factorial approach.
4. Balance Studies
   a. Nitrogen balance
5. Assessment of micronutrient status:
   a. Iron
   b. Vitamin C
   c. Vitamin A
   d. Vitamins from B-complex group
6. Bioavailability of selected nutrients

References


JOURNALS
1. Nutrition Reviews
2. Journal of Nutrition
3. American Journal of Clinical Nutrition
4. British Journal of Nutrition
5. European Journal of Clinical Nutrition
6. International Journal of Vitamin and Nutrition Research
Course Code: 16081202020300          Course Category: Core

Course Title: FOOD SCIENCE

Credit: 04          Contact hour/week=04

Objectives:

This Course is designed to:

- Provide an understanding of composition of various food stuffs.
- Familiarize students with changes occurring in various foodstuffs as a result of processing and cooking.
- Enable students to use the theoretical knowledge in various applications and food preparations.

Contents:

1. Constituents of Foods: Properties and significance

2. Water and Food Dispersions:
   - Free and bound water
   - Water activity and Food Spoilage
   - Freezing and ice structure
   - Colloidal salts, stabilization of colloidal systems, Rheology of food dispersions
   - Emulsions: Formation, stability, surfactants and emulsifiers.
   - Foams: Structure, formation and stabilization.

3. Polysaccharides, Sugars and Sweeteners
   - Starch: Structure, gelatinization, methods for following gelatinization changes.
   - Characteristics of some food starches. Effects of ingredients and conditions on gelatinization. Modified food starches.
   - Cellulose, hemicelluloses, pectins, gums.
   - Sugars and Sweeteners: Sugars, syrups, sugar alcohols, potent sweeteners, Sugar products.
   - Sweetener Chemistry related to usage in food products: solubility & crystallization, hygroscopic, fermentation & non-enzymatic browning.
4. **Fats**: Functional properties of fat and uses in food preparations. Fat deterioration and antioxidants.


6. **Beverages**: Synthetic and Natural, alcoholic and non-alcoholic, carbonated and non-carbonated, coffee, tea, cocoa, malted drinks.


8. **Food colours**: Pigments in animal and plant tissues, Food colours – Types, properties, safety issues

**REFERENCES**


JOURNALS

1. Journal of Food Sciences.
2. Advances in Food Research
3. Journal of Food Science and Technology
5. Cereal Science
6. Journal of Dairy Science
Course Code: 16081202020300P  
Course Category: Core  
Course Title: FOOD SCIENCE Practical  
Credit: 02  
Contact hour/week=04

1. Effect of solutes on boiling point and freezing point of water.  
2. Effect of types of water on characteristics of cooked vegetables, pulses and cereals.  
3. **Sugar ad Jaggery Cookery**: Relative sweetness, solubility and sizes of sugars, stages of sugar cookery, caramelization, crystallization, factors affecting crystal formation.  
5. **James and Jellies**: Pectin content of fruits, role of acid, pectin and sugar in jam and jelly formation. Use of gums as emulsifiers / stabilizers.  
6. **Gelatin**: Gelation, gel strength and factors affecting gelation. Ability to foam.  
7. **Leavened Products**: Fermentation – Use of Micro organisms (lactic acid, yeast), Steam as an agent, egg as an agent, chemical agents.  
8. **Beverages**: Factors affecting quality of beverages.

REFERENCES  


JOURNALS


9. Advances in Food Research

10. Journal of Food Science and Technology


12. Cereal Science

13. Journal of Dairy Science

Course Code: 16081202020401  
Course Category: Elective  
Course Title: Nutrition for Health & Fitness

Credit: 02  
Contact hour/week=02

Objectives
This course will prepare the students to:

- Understand the components of health and fitness and the role of nutrition in these.
- Make nutritional, dietary and physical activity recommendations to achieve fitness and well-being.
- Develop ability to evaluate fitness and well-being.

Contents

5. Dietary supplements and Ergogenic aids: Definitions, types and use of different ergogenic aids like nutritional, physiological, pharmacological etc and commercial supplements, Sports drinks, sports bars etc. Regulations regarding dietary supplements and ergogenics.

References


Journals


2. International Journal of Sports Nutrition
Principles of Nutritional Epidemiology.
Assessment of Food Consumption, Intake and validation of Assessment.
Biochemical Markers of nutrient intake and nutritional status.
Socio demographic and psycho social variables.
Anthropometric measurements.
Design and planning of Nutritional Epidemiological studies.
Assessing, Applying and Evaluating Epidemiological Studies.

References
Course Title: Food Product Development & Marketing

Credit: 02
Contact hour/week=02

Objectives
This course will enable students to:
- Understand and know various aspects of food product development including Food Science and Technology, Marketing and Consumer research, finance and communication.
- Develop products which meet consumer needs, and nutritionally and commercially viable.
- Recognize the potential for entrepreneurship through marketing.

Contents
New Food Products
- Definition, Classification, Characterization, Factors shaping new product development-Social concerns, health concerns, impact of technology and market place influence.

Reasons for new food product development (corporate, market place, technological and governmental influences) Assessing needs from various perspective.

Generation of New Product Ideas
- Internal sources of ideas
- External sources of ideas
- Market place analysis

Screening
Team Approach and involvement of various departments.
- Objectives of screening
- Criterion of screening

Refining the Screening Procedure for the product
- Sensory Evaluation
- Shelf life Testing
- Product Integrity and conformance to standards
References


Journals

1. International Journal of Food Science and Technology.
2. Food Technology
3. Journal of Food Technology
4. Trends in Food Science and Technology
5. Critical Reviews is Food Science and Nutrition
Course Title: Statistics & Computer Application

Credit: 04
Contact hour/week=04

Objectives:

- To understand the role of statistics and computer applications in research.
- To apply statistical techniques to research data for analyzing & interpreting data meaningfully.

NOTE: Students should be given hands on experiences to use appropriate software packages for selected statistical analyses.

Unit I: Statistical Analysis

- Conceptual understanding of statistical measures
- Measurement of central tendency
- Measurement of variation
- Skewness and Kurtosis
- Properties and uses of Binomial and normal distribution

Unit II: Testing of Hypothesis

- Type I and Type II errors
- Levels of Significance

Unit III: Parametric — Small and Large sample test

- Chi square test
- Independence of Attributes 2x2 and rxc contingency tables

Unit IV: Student 't' test and F test

Unit V: Correlation, coefficient of correlation
Course Code: 16081202020500P       Course Category: SO

Course title: Computer Application Practical

Credit: 02                      Contact hour/week=04

1. MS Office. (A) MS Word (B) MS Excel (C) MS Power point
2. SPSS

References:
**Detail Syllabus of M.Sc. Home Science**

**Foods and Nutrition**

*(Syllabus format on CBCS: June-2016)*

### Semester-III: Foods & Nutrition

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title of The Course</th>
<th>CC</th>
<th>CCr</th>
<th>WH</th>
<th>IM</th>
<th>EM</th>
<th>TM</th>
</tr>
</thead>
<tbody>
<tr>
<td>16080102030100</td>
<td>Institutional Food Administration</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102030100 (P)</td>
<td>Institutional Food Administration (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>--</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16080102030200</td>
<td>Advanced Food Microbiology</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102030200 (P)</td>
<td>Advanced Food Microbiology (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>--</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16080102030300</td>
<td>Advanced Human Physiology</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102030300(P)</td>
<td>Instrumentation for Food Analysis (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>--</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16081202030401</td>
<td>Dietetic techniques and patient counseling</td>
<td>EL</td>
<td>02</td>
<td>02</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>16080102030402</td>
<td>Management of Nutrition programme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16080102030403</td>
<td>Food Toxicology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16081202030500</td>
<td>Scientific Writing</td>
<td>SO</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>24</td>
<td>30</td>
<td>135</td>
<td>465</td>
<td>600</td>
</tr>
</tbody>
</table>

CC=Course Category, CCr= Course Credit, WH= Working Hours, IM=Internal Marks, EM =External Marks, TM=Total Marks, Course revision year=16, Faculty code=08, Subject code,= 01 for Foods & Nutrition, 02 for General Home Science and 12 for common for both, Level=02 (PG), Sem=01-04, Paper no= 01-05, Options 00 for Core, Multidisciplinary (MD), and Skill oriented (SO), for Elective =01-05 (EL)

**Interpretation of code** 16080102030100 Here 16 means 2016, 08 Home science faculty, 01 means foods & nutrition, 02 means PG level, 03 Semester III, again 01 is paper no and last 00 is for Core course.)
Course Code: 16080102030100  
Course Category: Core

Course Title: Institutional Food Administration

Credit: 04  
Contact hour/week=04

Objectives:

- To develop a knowledge base in key areas of Institutional Food Administration
- To provide practical field level experience in Institutional Food Administration.
- To impart necessary expertise to functional as a food service manager
- To equip individual to start their own food service unit leading to entrepreneurship
- To develop critical abilities and provide basic grounding in research techniques.

Theory

1. Introduction to Food Service Systems
   - Evolution of the Food service industry
   - Characteristics of the various types of food service units

2. Approaches to Management
   - Theories of Management

3. Management of Resources
   
   Finance
   - Determining the finance needed to establish or run an unit
   - Budgets
   - Sources of finance
   - Planning adequate cash flow

   Space & Equipment
   - Step in Planning layouts
   - Determining equipment
   - Maintenance of equipment
   - Layout analysis

   Material
   - Menu planning
   - Purchase
• Storage
• Quantity food production
• Service and modes of delivery

Staff
• Manpower planning
• Recruitment, induction, training, motivation and performance appraisal

Time and Energy
• Measures of utilization and conservation

4. Cost Accounting / Analysis
• Food cost analysis

5. Marketing and Sales Management
• Marketing strategies
• Sales analysis
• Market Promotion

6. Quality Assurance
• Food quality
• Total quality management
Course Title: Institutional Food Administration Practical

Credit: 02  
Contact hour/week=04

1. Market Survey and Analysis of processed and finished products
2. Evaluation of Food Service Unit-2 Conventional, Commissary.
4. Layout analysis of Kitchens -2
5. Planning menus for quantity.
   - Banquet
   - Outdoor catering
   - Packed meals
   - Restaurant
7. Cost Analysis of menu in
   - College canteen
   - Hostel mess
   - Hospitals (Private, charitable, government)
8. Analysis of Food Safety and Hygiene
9. Preparation of project to established new food service units

References: Management


Personal Management


Cost Control


Layout and Design


Course Code: 16080102030200

Course Category: Core

Course Title: Advanced Food Microbiology

Credit: 04

Contact hour/week=04

Objectives:

This course will enable the student to:

- Gain deeper knowledge of role of micro-organisms in human and environment.
- Understand the importance of micro-organism in food spoilage and to learn advanced, techniques used in food preservation.
- Understand the latest procedures adopted in various food operations to prevent food-borne. Disorders and legal aspects involved in these areas.

Contents

1. Introduction to historical developments in food preservation. Spoilage, infections and legislation.
2. Micro-organisms of importance in Food: Their primary sources in foods, Morphology, cultural characteristics.
   - Factors affecting the growth of microorganisms in food. Intrinsic and Extrinsic parameters that affect microbial growth
3. Spoilage of different groups of Foods: Meat, eggs and poultry, fish and other sea foods, canned food.
5. Food borne disease: Bacterial, food-borne important, Mycotoxins.
6. Role of Microbes in fermented foods.
Course Title: Advanced Food Microbiology Practical

Credit: 02

Contact hour/week=04

Course Category: Core

Course Code: 16080102030200P

a. Preparation of common laboratory media and special media for cultivation of bacteria, yeast & molds.
b. Staining of Bacteria: Gram's staining, Acid-fast and Motility of bacteria, staining of yeast and molds.
c. Study of environment around us as sources of transmission of microorganisms in foods. Assessment of surface sanitation of food preparation units swab and rinse techniques.
d. Isolation of microorganisms: Different methods and maintenance of cultures of microorganisms.
e. Bacteriological analysis of water and milk, Total count, MPN Coliform (Count) and MBRT, IMVIC etc.
f. To Perform various biochemical tests used in identification commonly found bacteria in foods: IMVIC urease, $H_2S$, Catalase, Coagulase, gelatin and fermentation (Acid/ Gas).
g. Demonstration of available rapid methods and diagnostic kits used in identification of microorganisms or their product.
h. Visits (at least two) to food processing unit or any other organization dealing with advanced methods in food microbiology.

References


Journals

14. Journals of Food Science Published by the Institute of Food technologists, Chicago 1u. U.S.A.
15. Journal of Food Science and Technology Published by Association of Food Scientists and Technologists (India) CFTRI-MYSORE.
16. Food Technology Published by the Institute of Food Technologists, Chicago 1u. U.S.A.
Course Code: 16080102030300
Course Category: Core
Course Title: Advanced Human Physiology
Credit: 04
Contact hour/week=04

Objectives:
This course will enable students to:

- Advance their understanding of some of the relevant issues and topics of human physiology.
- Enable the students to understand the integrated function of the system and the grounding of nutritional science in physiology.
- Understand alterations of structure and function in various organs and systems in disease conditions.

Contents

1. **Cell structure and function**: Levels of cellular organization and function organelles, tissues, organs and systems. Brief review: Cell membrane transport across cell, membrane and intercellular communication.

2. **Nervous System**: Review of structure and function of neuron - conduction of nerve impulse, synapses, and role of neurotransmitters - Organization of central and Peripheral nervous system.

3. **Heat and Circulations**: Location and Pericardial Membranes, Chambers—Vessels and Valves, Coronary Vessels, Cardiac Cycle and Heart Sounds, Cardiac Conduction Pathway, Heart Rate, Cardiac Output, Regulation of Heart Rate, , Arteries, Veins, Capillaries, Pathways of Circulation, Velocity of Blood Flow, Blood Pressure, Regulation of Blood Pressure, Aging and the Heart and Vascular System,

4. **Excretory system**: Structure and function of nephron - Urine formation - Role of kidney in maintaining pH of blood - diuretics

5. **Immune system**: Cell mediated and humeral Immunity: Activation of WBC and production of antibodies. Role in inflammation and defense.

References


Course Title: Instrumentation for Food Analysis Practical

Credit: 02  Contact hour/week=04

Objectives:

This course is designed to:

- Introduce students to various modern instrumental techniques in food analysis.
- Understand the applications, strengths and limitations of different methods.

Practicals

1. Spectrometric Methods
   a. UV and visible molecular absorption spectrometry
   c. Fluorescence Spectrometry
   d. Atomic mass Spectrometry
   e. Infrared Spectrometry

2. Separation Techniques
   a. Chromatographic Separations: Liquid, GC, TLC, super critical fluid extraction chromatography.
   b. Electrophoresis.

3. Viscosity and Consistency Measurements of Food. Measurements of Rheological properties


5. Relative Humidity and Water Activity.

References


**Course Title:** Dietetic Techniques & Patient Counseling

**Credit:** 02

**Contact hour/week:** 02

**UNIT -I**
Dietician as part of the medical team and outreach services. Role of dietician. Essential qualities.

**UNIT -II**
Medical history, assessment techniques for obtaining relevant information from patients' profile.

**UNIT -III**
Dietary diagnosis and tests for nutritional status correlating clinical and dietary information.

**UNIT -IV**
Patient counseling. Assessment of patient needs, establishing rapport and counseling relationship, resources and aids to counseling relationship, resources and aids to counseling.

**UNIT -V**
Aesthetic attributes - Nutritional significance of diet for different clinical conditions. Follow visit and patients' education.

**Reference:**
3. Field Exchange, Newsletters by Emergency Nutrition Network, Dept. of Community Health and General Practice, Ireland.
Course Code: 16080102030402  
Course Category: Elective

Course Title: Management of Nutrition Programme

Credit: 02  
Contact hour/week=02

Objectives

This course will enable students to:

- Be familiar with various programmes which can be undertaken to prevent and control nutritional problems at regional and national level.
- Be able to plan, implement, monitor and evaluate programmes.

Contents

1. **Global, National and Regional Concerns** – Situation of vulnerable groups vis-à-vis food, nutrition and health security.


4. **Appraisal of existing programmes and interventions** – Merits, demerits. Lacunae-gaps vis-à-vis objectives and goals.

5. **Implementation of Programmes** – Developing prototypes, training and HRD aspects of the programmes. Pilot and prototype studies, innovations.


7. **Management Information Systems (MIS).**
References


Course Title: Food Toxicology

Credit: 02

Objectives:

This course is designed for students to:

- Familiarize with hazards and toxicity associated with food and their implications for health.
- Know the various kinds of hazards.
- Be familiar with various tests.

Contents

1. Introduction to Food Safety and Toxicology: Hazards Microbiological, Nutritional, Environmental, natural Toxicants, Pesticide residues and Food Additives.
   - Biotechnology and food safety
   - HACCP
2. Microbial Problems in Food Safety including Mycotoxins and viruses.
4. Naturally occurring toxicants & Foods contaminants: Sea food toxins, biogenic amines, coffee & methylxanthines, toxicity of mushrooms alkaloids, phenolic compounds, glucosinolates, protease inhibitors, phytate, other antinutritional compounds.
5. Environmental pollution sources: Air, water Hazards involved, Water treatment and waste management.

References:


Course Code: 16081202030500  
Course Category: Skill Oriented

Course Title: Scientific Writing

Credit: 04  
Contact hour/week=04

Objectives:
- To be able to appreciate and understand importance of writing scientifically.
- To develop competence in writing and abstracting skills.

Contents

Unit I: Scientific writing as a means of communication
- Different forms of scientific writing
- Articles in journals
- Research notes and reports
- Review articles
- Monographs
- Dissertation
- Bibliography
- Book chapters and articles

Unit II: Outlines
- Concept of outline
- Importance of outlines
- Objectives of outline
- Types of outlines

Unit III: General principle of writing
- preparing a text for submission and publication
- Drafting
- Outline
- Proof reading
- Brevity and precision
- concepts of preface
- notes (end and footnotes), glossary
- prologue and epilogue
- appendix
• bibliography (annotated) and references cited
• review and index

Unit IV: Dissertation/ Research reports/ Thesis
• Introduction
• Review of literature
• Research design
• Results and discussion
• Summary
• Abstracts
• References/ bibliography
• Justification and recommendations

Unit VI: Writing for Grants
• The question to be addressed
• Rational, importance and justification
• Empirical and theoretical frame work
• Pilot study
• Research proposal
• Research design
• Stage wise organization of study
• Expected outcome and importance
• Available infrastructure and resources
• Budgeting
• Executive Summary

References
3. Dunn, F.V. & Others. (Ed.) Disseminating research: Changing practice, N.Y. Sage


**Detail Syllabus of M.Sc. Home Science**

**Foods and Nutrition**

*(Syllabus format on CBCS: June-2016)*

### Semester-IV: Foods & Nutrition

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title of The Course</th>
<th>CC</th>
<th>CCr</th>
<th>WH</th>
<th>IM</th>
<th>EM</th>
<th>TM</th>
</tr>
</thead>
<tbody>
<tr>
<td>16080102040100</td>
<td>Food Processing and Technology</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102040100 (P)</td>
<td>Food Processing and Technology (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16080102040200</td>
<td>Advanced Nutrition – II</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102040300</td>
<td>Food Safety and Quality Control</td>
<td>Core</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16080102040300 (P)</td>
<td>Food Safety and Quality Control (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>---</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16080102040401</td>
<td>Nutrition in Critical Care</td>
<td>EL</td>
<td>02</td>
<td>02</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>16080102040402</td>
<td>Current Trends in Public Nutrition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16080102040403</td>
<td>Current Trends in Foods &amp; Nutrition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16081202040500</td>
<td>Assessment of Nutritional Status</td>
<td>SO</td>
<td>04</td>
<td>04</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>16081202040500 (P)</td>
<td>Assessment of Nutritional Status (Pra)</td>
<td></td>
<td>02</td>
<td>04</td>
<td>--</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>24</td>
<td>30</td>
<td>135</td>
<td>465</td>
<td>600</td>
</tr>
</tbody>
</table>

CC=Course Category, CCr= Course Credit, WH= Working Hours, IM=Internal Marks, EM=External Marks, TM=Total Marks, Course revision year=16, Faculty code=08, Subject code=01 for Foods & Nutrition, 02 for General Home Science and 12 for common for both, Level=02 (PG), Sem=01-04, Paper no= 01-05, Options 00 for Core, Multidisciplinary (MD), and Skill oriented (SO), for Elective =01-05 (EL)

**Interpretation of code** 16080102040100 Here 16 means 2016, 08 Home science faculty, 01 means foods & nutrition, 02 means PG level, 04 Semester IV , again 01 is paper no and last 00 is for Core course.)
Course Code: 16080102040100
Course Category: Core

Course Title: FOOD PROCESSING AND TECHNOLOGY (Core)
Credit: 04
Contact hour/week=04

Objectives:
This course is designed for students to:

- Impact systematic knowledge of basic and applied aspects of food processing and technology.
- Provide the necessary knowledge of basic principles and procedures in the production of important food products.
- Orient the students to potential use of various by products of food industry.

Contents

1. **Physical principles in food processing operations:**
   Thermal processing: Degree of processing of preservation, selecting heat, treatments, heat resistance of micro organisms, nature of heat transfer, protective effects of food constituents, types of thermal treatments.


3. **Wheat Technology** - Production, processing, manufacture of breakfast cereals

4. **Pulses** - Production, types of processing of different pulse products - Soyabean Processing.

5. **Technology of oil seeds** - Processing, meal concentrates and isolates.

6. **Mushroom** - Production, processing, utilization.

7. **Meat** - Production, processing, smoking and curing of meat, grading.

8. **Poultry** - Production, preparing poultry for consumption, packaging.

9. **Fish** - Production, effect of handling practices, storage of eggs.

10. **Waste disposal and sanitation:** Waste characteristics, treatments and technologies, food plant sanitation.

REFERENCES
9. Processed food Industry
10. Journal of Indian food industry
Course Title: FOOD PROCESSING AND TECHNOLOGY Practicals

Credit: 02

1. Blanching and browning control
3. Tomato processing
4. Changes in ascorbic acid content during different types of processing in food sample
5. Acid value of different oils and changes during processing.
6. Estimation of ascorbic acid from food sample which is steamed, boiled and fresh
7. To study the effect of different ingredients on sag and organoleptic properties of jelly.
8. To study the effect of different sweeteners on organoleptic properties of fruits.
9. Extending Shelf Life of Fruits using different food preservatives
10. Prepare a project report for any food processing plant.

References:


Course Code: 16080102040200  
Course Category: Core

Course Title: ADVANCED NUTRITION – II

Credit: 04  
Contact hour/week=04

Objectives:

This course is designed to:

- Provide in depth knowledge of the physiological and metabolic role of various nutrients and their interactions in human nutrition.
- Enable students to understand the basis of human nutritional requirements and recommendations through the life cycle.
- Enable students to understand the pharmacological actions to nutrients and their implications.
- Familiarize students with the recent advances in nutrition.

Contents


2. Minerals: (Note: For each nutrient sources, bioavailability, metabolism, function, requirements. RDI/ESADDI, deficiency and toxicity, interactions with other nutrients are to be discussed).
   - **Macro minerals**: calcium, phosphorus, magnesium, sodium, potassium & chloride.
   - **Micro minerals**: Iron, copper, zinc, manganese, iodine, fluoride.
   - **Trace minerals**: Selenium, cobalt, chromium, vanadium, silicon, boron, nickel.

3. Vitamins; Historical background, structure, food sources, absorption and transport, metabolism, biochemical function, assessment of status. Interactions with other nutrients Physiological, pharmacological and therapeutic effects, toxicity and deficiency with respect to the following:
   - a) Fat soluble: Vitamins A, D, E & K.
   - b) Water soluble: Thiamine, riboflavin, niacin, biotin, pyridoxine, folic acid, pantothenic acid, ascorbic acid, cyanocobalamin, choline, inositol.
4. Non-nutritive food components with potential health effects: Polyphenols, tannins, phytate, phytoestrogens, cyanogenic compounds, lectins and saponins.


References


JOURNALS

10. Nutrition Reviews

11. Journal of Nutrition


13. British Journal of Nutrition

Course Code: 16080102040300  
Course Category: Core  
Course Title: FOOD SAFETY AND QUALITY CONTROL (Core)  
Credit: 04  
Contact hour/week=04  

Objectives:
This Course will enable students to:

- Know the importance of quality assurance in food industry.
- Know the various tests and standards for quality assessment and food safety.
- Know the various tests used to detect food adulterants.
- Be familiar with the fundamentals that should be considered for successful quality control programme.

Contents
1. Introduction to quality assurance and food safety assurance. Current concepts of quality control.
2. Quality assurance programme: Quality plan, documentation of records, process control and HACCP, hygiene and housekeeping, corrective action, quality and programme and total quality process.
3. Product Evaluation:
   - Sampling for product evaluation and line control.
   - Specification and Food standards, International, National
   - Mandatory, Voluntary.
   - Sample preparations
   - Reporting results and reliability of analysis.
4. Test for specific raw food ingredients and processed Food including additives:
   - Nutrient analysis
   - Tests of adulterants
5. Consumer Protection
Course Code: 16080102040300P  
Course Category: Core  

Course Title: FOOD SAFETY AND QUALITY CONTROL Practical  
Credit: 02  
Contact hour/week=04  

Objectives  
1. To test different foods for their quality  
2. To detect adulteration in different foods  
3. To be familiar with test used for quality control.  

1. Assessment of purity and quality using appropriate standard test for the following :  
   - Water including mineral water  
   - Milk ad milk products  
   - Fats and oil including butter, ghee and hydrogenated fat  
   - Ice creams and sherbets  
   - Cereals and cereal product  
   - Pulses and legumes  
   - Spices ad condiments and salt, pickles, sauces and chutneys.  
   - Tea and Coffee  
   - Confectionery  
   - Specific food ingredients such as vinegar.  
   - Fruit juices, concentrates and beverages.  

2. Detection /Estimation of Contaminants  

References  


10. James, C.S. Academic and Professional (Champman and Hall), Madras.


Course Code: 16080102040401
Course Category: Elective
Course Title: Nutrition in critical Care
Credit: 02
Contact hour/week=02

Objectives
The course will enable the students to:

- Understand the physiology, metabolism and special nutritional requirements of the critically ill.
- Be familiar with the special nutritional support techniques and feeding formulations to meet their nutritional needs.

Contents
1. Nutritional screening and nutritional status assessment of the critically ill.
2. Nutritional support systems and other life-saving measures for the critically ill.
3. Role of immuno enhancers, conditionally essential nutrients, immunosuppressants, and special diets in critical care
4. Patho-physiological, clinical and metabolic aspects, understanding of the special nutritional requirements, nutritional goals and monitoring the therapy in critical illnesses like
   - Stress, trauma, sepsis, burns
   - CV complications and surgery
   - Cancer
   - AIDS
   - GI tract surgery, GER (Gastro-esophageal reflux) and complications
   - Hepatic failure and transplants
   - Neurosurgery
   - Celiac disease


References

Current Trends in Public Nutrition

Credit: 02
Contact hour/week=02

It deals with current topics and issues related to Public Nutrition.

(1) Current strategies and programmes to combat public nutrition.

(2) Recent advances in nutrition education programme.

(3) Food security.

(4) Food fortification.

(5) Relationship between fertility, nutrition and quality of life.

(6) Recent advances in public health and nutrition.
Course Code: 1608010240403  
Course Category: Elective

Course Title: CURRENT TRENDS IN FOODS & NUTRITION

Credit: 02  
Contact hour/week=02

Contents

Recent developments in Foods & Nutrition such as :

(1) Dietary fiber: Definition, classification, properties, physiological effects and therapeutic uses.

(2) Essential fatty acids: Definition, structures, sources, bioavailability, functions and health benefits.

(3) Anti oxidants: Definition, classification, free radical generation and it’s effect on health, role of different antioxidants in health.

(4) Genetically modified foods: Advantages and disadvantages.


(6) Fermented foods: Importance, benefits and examples.

(7) Pica and celiac disease: causes, prevention and diet.

(8) Role of Zinc and Manganese in health.

(9) Nutrigenomics and nutrigenetics: Definition and importance.

References:

(1) Jewels of foods and nutrition, Dr. R. V. Raval, Department of Home Science, Saurashtra University, Rajkot.

(2) WHO – Technical report series.

Course Code: 16081202040500      Course Category: Skill Oriented

Course Title: ASSESSMENT OF NUTRITIONAL STATUS

Credit: 04      Contact hour/week=04

Objectives:

The course is designed to:

- Orient the students with all the important state-of-the-art methodologies applied in nutritional assessment and surveillance of human groups.
- Develop specific skills to apply the most widely used methods.

Contents

Theory

1. Nutritional assessment as a tool for improving the quality of life of various segments of the population including hospitalized patients.

2. Current methodologies of assessment of nutritional status, their interpretation and comparative applications of the following:
   - Food consumption
   - Anthropometry
   - Clinical and Laboratory
   - Rapid Assessment & PRA
   - Functional indicators such as grip strength, respiratory fitness, Harvard Step test, squatting test.

3. Nutritional Surveillance – Basic concepts, uses and setting up of surveillance systems.

4. Monitoring and Evaluation
Course Code: 16081202040500P  
Course Category: Skill Oriented

Course Title: ASSESSMENT OF NUTRITIONAL STATUS Practical

Credit: 02  
Contact hour/week=04

1. Training in all assessment techniques applicable for individuals and community, including ones used for hospital – based patients
   • Validity and reliability of these techniques.
2. Community based project for assessment of nutritional status of any vulnerable group.
3. A small evaluation study of a nutrition project.

References

9. FAO Nutritional Studies No.4 (1953): Dietary Surveys: Their Technique and Interpretation, FAO.


