UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12/18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Subject</th>
<th>Sl. No.</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anthropology (Honours / General)</td>
<td>29</td>
<td>Mathematics (Honours / General)</td>
</tr>
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<td>2</td>
<td>Arabic (Honours / General)</td>
<td>30</td>
<td>Microbiology (Honours / General)</td>
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<td>3</td>
<td>Persian (Honours / General)</td>
<td>31</td>
<td>Mol. Biology (General)</td>
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<td>4</td>
<td>Bengali (Honours / General /LCC2/AECC1)</td>
<td>32</td>
<td>Philosophy (Honours / General)</td>
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<td>5</td>
<td>Bio-Chemistry (Honours / General)</td>
<td>33</td>
<td>Physical Education (General)</td>
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<td>6</td>
<td>Botany (Honours / General)</td>
<td>34</td>
<td>Physics (Honours / General)</td>
</tr>
<tr>
<td>7</td>
<td>Chemistry (Honours / General)</td>
<td>35</td>
<td>Physiology (Honours / General)</td>
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<td>8</td>
<td>Computer Science (Honours / General)</td>
<td>36</td>
<td>Political Science (Honours / General)</td>
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<td>9</td>
<td>Defence Studies (General)</td>
<td>37</td>
<td>Psychology (Honours / General)</td>
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<td>10</td>
<td>Economics (Honours / General)</td>
<td>38</td>
<td>Sanskrit (Honours / General)</td>
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<td>11</td>
<td>Education (Honours / General)</td>
<td>39</td>
<td>Social Science (General)</td>
</tr>
<tr>
<td>12</td>
<td>Electronics (Honours / General)</td>
<td>40</td>
<td>Sociology (Honours / General)</td>
</tr>
<tr>
<td>13</td>
<td>English (Honours / General / LCC1/LCC2/AECC1)</td>
<td>41</td>
<td>Statistics (Honours / General)</td>
</tr>
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<td>14</td>
<td>Environmental Science (Honours / General)</td>
<td>42</td>
<td>Urdu (Honours / General / LCC2/AECC1)</td>
</tr>
<tr>
<td>15</td>
<td>Environmental Studies (AECC2)</td>
<td>43</td>
<td>Women Studies (General)</td>
</tr>
<tr>
<td>16</td>
<td>Film Studies (General)</td>
<td>44</td>
<td>Zoology (Honours / General)</td>
</tr>
<tr>
<td>17</td>
<td>Food Nutrition (Honours / General)</td>
<td>45</td>
<td>Industrial Fish and Fisheries - IFFV (Major)</td>
</tr>
<tr>
<td>18</td>
<td>French (General)</td>
<td>46</td>
<td>Sericulture - SRTV (Major)</td>
</tr>
<tr>
<td>19</td>
<td>Geography (Honours / General)</td>
<td>47</td>
<td>Computer Applications - CMAV (Major)</td>
</tr>
<tr>
<td>20</td>
<td>Geology (Honours / General)</td>
<td>48</td>
<td>Tourism and Travel Management - TTMV (Major)</td>
</tr>
<tr>
<td>21</td>
<td>Hindi (Honours / General /LCC2/AECC1)</td>
<td>49</td>
<td>Advertising Sales Promotion and Sales Management - ASPV (Major)</td>
</tr>
<tr>
<td>22</td>
<td>History (Honours / General)</td>
<td>50</td>
<td>Communicative English - CMEV (Major)</td>
</tr>
<tr>
<td>23</td>
<td>Islamic History Culture (Honours / General)</td>
<td>51</td>
<td>Clinical Nutrition and Dietetics CNDV (Major)</td>
</tr>
<tr>
<td>24</td>
<td>Home Science Extension Education (General)</td>
<td>52</td>
<td>Bachelor of Business Administration (BBA) (Honours)</td>
</tr>
<tr>
<td>25</td>
<td>House Hold Art (General)</td>
<td>53</td>
<td>Bachelor of Fashion and Apparel Design - (B.F.A.D.) (Honours)</td>
</tr>
<tr>
<td>26</td>
<td>Human Development (Honours / General)</td>
<td>54</td>
<td>Bachelor of Fine Art (B.F.A.) (Honours)</td>
</tr>
<tr>
<td>27</td>
<td>Human Rights (General)</td>
<td>55</td>
<td>B. Music (Honours / General) and Music (General)</td>
</tr>
<tr>
<td>28</td>
<td>Journalism and Mass Communication (Honours / General)</td>
<td></td>
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</tbody>
</table>

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

(Dr. Santanu Paul)
Deputy Registrar
## SEMESTER WISE COURSE FOR B.SC. MAJOR IN CLINICAL NUTRITION & DIETETICS

<table>
<thead>
<tr>
<th></th>
<th>Sem-1</th>
<th>Sem-2</th>
<th>Sem-3</th>
<th>Sem-4</th>
<th>Sem-5</th>
<th>Sem-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Course (CC)</td>
<td>2Th+ 2P CC-1 &amp; 2</td>
<td>2Th+ 2P CC-3 &amp; 4</td>
<td>3Th+ 2P CC-5, 6 &amp; 7</td>
<td>3Th+ 3P CC-8, 9 &amp; 10</td>
<td>2Th+ 2P CC-11 &amp; 12</td>
<td>2Th+ 1P CC-13 &amp; 14</td>
</tr>
</tbody>
</table>

**Elective Courses:**

1. **Generic Elective (GE)**
   - i) 1Th+ 1P GE-1
   - ii) 1Th+ 1P GE-2
   - iii) 1Th+ 1P GE-3
   - iv) 1Th+ 1P GE-4

2. **Discipline Specific Elective (DSE)**
   - 2Th+ 2P DSE-A(1/2)
   - 2Th+ 2P DSE-B(1/2)

3. **Ability Enhancement Course (AECC)**
   - 1Th+ 0 P AECC-1
   - 1Th+ 0 P AECC-2

4. **Skill Enhancement Course (SEC)**
   - 1Th+ 0 P SEC-A(1/2)
   - 1Th+ 0 P SEC-B(1/2)

5. **Total No. of Courses and Marks**
   - Sem-1: 4x100= 400
   - Sem-2: 4x100=400
   - Sem-3: 5x100=500
   - Sem-4: 5x100=500
   - Sem-5: 4x100=400
   - Sem-6: 4x100=400

6. **Total Credits**
   - Sem-1: 20
   - Sem-2: 20
   - Sem-3: 26
   - Sem-4: 26
   - Sem-5: 24
   - Sem-6: 24

Th= Theory, P= Practical

- **CC/GE/DSE:** Each theory and practical course have 4 and 2 credits respectively. Tutorial course has 1 credit.

- **GE:** Covering two disciplines with two courses; any discipline in any semester; CC of different subjects in general course is to be treated as GE for Honours course.

- **DSE/SEC:** Choice must be group specific to each semester.

- **AECC/SEC:** Each course has two credits.

- **AECC1:** Communicative English/ MIL; AECC2: Environmental Studies.
<table>
<thead>
<tr>
<th>Semester</th>
<th>Core course (CC)</th>
<th>Ability enhancement compulsory course (AECC)</th>
<th>Skill enhancement course (SEC)</th>
<th>Discipline specific course (DSE)</th>
<th>Generic elective course (GE)</th>
</tr>
</thead>
</table>
| I | CC-1-Th: Basic Nutrition  
CC-1-P: Basic Nutrition | AECC 1: Communicative English / MIL (Bengali/Hindi/Urdu) | | | GE-1 |
| II | CC-3-Th: Nutritional Biochemistry –I  
CC-3-P: Nutritional Biochemistry –I | AECC 2: Environmental Studies | | | GE-2 |
| III | CC-5-Th-5: Nutritional Biochemistry-II  
CC-5-P: Nutritional Biochemistry-II  
CC-6-Th: Advanced Nutrition  
CC-6-P: Advanced Nutrition | SEC- 1 | | | GE-3 |
<table>
<thead>
<tr>
<th>Th</th>
<th>Course Description</th>
<th>Section</th>
<th>GE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>CC-7-Th: Food Commodities</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>CC-7-P: Food Commodities</td>
<td></td>
<td></td>
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<tr>
<td>IV</td>
<td>CC-8-Th: Food Microbiology</td>
<td></td>
<td>SEC-2</td>
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<td></td>
<td>CC-8-P: Food Microbiology</td>
<td></td>
<td>GE-4</td>
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<tr>
<td></td>
<td>CC-9-Th: Family Meal Management</td>
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<td></td>
<td>CC-9-P: Family Meal Management</td>
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<tr>
<td></td>
<td>CC-10-Th: Dietetics-I</td>
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<tr>
<td></td>
<td>CC-10-P: Dietetics-I</td>
<td></td>
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<tr>
<td>V</td>
<td>CC-11-Th: Dietetics-II</td>
<td></td>
<td>DSE-1</td>
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<td></td>
<td>CC-11P: Dietetics-II</td>
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<tr>
<td></td>
<td>CC-12-Th: Quantity Food Production &amp; Service</td>
<td></td>
<td>DSE-2</td>
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<tr>
<td></td>
<td>CC-12-P: Quantity Food Production &amp; Service</td>
<td></td>
<td></td>
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<tr>
<td>VI</td>
<td>CC-13-Th: Entrepreneurship Development</td>
<td></td>
<td>DSE-3</td>
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<tr>
<td></td>
<td>CC-14-Th: Community Nutrition</td>
<td></td>
<td>DSE-4</td>
</tr>
<tr>
<td></td>
<td>CC-14-P: Community Nutrition</td>
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</tbody>
</table>
DISTRIBUTION OF CREDITS IN THE COURSE CURRICULUM

<table>
<thead>
<tr>
<th>Semester</th>
<th>Name of course</th>
<th>Total credits</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Core Course (CC)</td>
<td>Ability enhancement compulsory course (AECC)</td>
</tr>
<tr>
<td>I</td>
<td>6x2=12</td>
<td>2x1=2</td>
</tr>
<tr>
<td>II</td>
<td>6x2=12</td>
<td>2x1=2</td>
</tr>
<tr>
<td>III</td>
<td>6x2=18</td>
<td></td>
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<tr>
<td>IV</td>
<td>6x3=18</td>
<td></td>
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<tr>
<td>V</td>
<td>6x2=12</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>6x2=12</td>
<td></td>
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<tr>
<td>Total Course</td>
<td>14 (CC) (14×6)=84 credits</td>
<td>2 (AECC) (2x2)=4credits</td>
</tr>
</tbody>
</table>

NOTE:
1. 14 Core Courses (CCs) should be compulsorily studied for B.Sc. Major in Clinical Nutrition & Dietetics
2. 4 DSE & 2 SEC are to be studied by the B.Sc. Major in Clinical Nutrition & Dietetics students.
3. 4 GE subjects in B.Sc. Major in Clinical Nutrition & Dietetics Syllabus are to be chosen from 2 subjects of choice. (one science one arts or both science)
4. Clinical Nutrition & Dietetics (Major) students have to choose chemistry as GE course
CORE COURSE (CC)  
FIRST SEMESTER  

CC-1-Th: BASIC NUTRITION  
4 CREDITS

1. Introduction to nutrition-food as a source of nutrients, function of foods, definition of nutrition, nutrients, adequate, optimum and good nutrition, malnutrition.

2. Inter-relationship between nutrition and health-visible symptoms of good health.

3. Food guide-basic five food groups-how to use food guide.

4. Use of food in body digestion, absorption, transport, utilization of nutrients in the body.

5. Water-as a nutrient, function, sources, requirement, water balance-effect of deficiency.


7. Fat and oils-composition, saturated and unsaturated fatty acids, classification of food sources, functions of fats.


9. Energy-unit of energy, food as a source of energy, energy value of food. The body’s need for energy B.M.R activities, for utilization of food to fat energy requirement.

10. Acid-base balance.

CC-1-P: BASIC NUTRITION (PRACTICAL)  
2 CREDITS

1. Identification of Mono, Di and polysaccharides
2. Identification of Proteins
3. Identification of glycerol.

REFERENCE BOOKS/JOURNALS:

CC-2-Th: BASIC HUMAN PHYSIOLOGY  

1. Animal cell: structure & function

2. Definition, structure & function of different types of tissues:
   a) Epithelial tissue - Disorders of skin: dermatitis, dandruff & burns
   b) Connective tissue
   c) Nervous tissue
      - Classification of nervous system
      - Central nervous system: brain and spinal cord
      - Functions of different parts of the brain - Peripheral nervous system, Automatic and sympathetic nervous system
      - Nerve impulse, synapse, reflex action, voluntary action.
   d) Muscular tissue with special emphasis on blood & bone
      - General account of the muscular system
      - Types of muscles - striated, non-striated, cardiac: similarities & differences.
      - Muscular contraction.
      - Blood pressure-pulse, systolic, diastolic
      - A general account of axial skeleton and appendicular skeleton.

3. Digestive system:
   b) Digestion & absorption of carbohydrate, protein and fat. Name & functions of enzymes & hormones in metabolism. Metabolism in brief: (Glycolysis, Glycogeneis, gluconeogenesis, Cori’s cycle, Kreb’s cycle, deamination, transamination, Diabetes mellitus)
   c) Disorders of gastrointestinal tract: Vomiting, constipation, diarrhoea, Abdominal pain, peptic and duodenal ulcers, piles

CC-2-P: BASIC HUMAN PHYSIOLOGY (PRACTICAL)  

1. Microscope and its use.
2. Determination of blood pressure - systolic and diastolic
3. Recording of pulse
4. Determination of bleeding time and coagulation time.
5. Detection of blood group and Rhesus factor.
6. Identification of the prepared slides - blood cells, Stomach, Intestine - small and large, Liver and Pancreas
REFERENCE BOOKS/ JOURNALS:


SECOND SEMESTER

CC-3-Th: NUTRITIONAL BIOCHEMISTRY -I 4 CREDITS

1. Introduction to Biochemistry: Definition, objectives, scope and inter relationship between biochemistry and other biological science.

2. Molecular aspect of transport, passive diffusion, facilitated diffusion, active transport, nutrients and energy needs, coupled reactions.

3. Biological oxidation: electron transport mechanism NADH dehydrogenase, cytochromes, electron transport chain, oxidative phosphorylation, energy conservation, high energy phosphate bond, storage and release of high energy phosphate, myokinase reaction.

4. Genetic control of metabolism:
   a. Nucleic acids- types components, structure, replication.
   b. Genetic repair mechanisms.
   c. Genetic code-protein biosynthesis.
   d. Viruses and recombinant DNA and bioengineering.

CC-3-P: NUTRITIONAL BIOCHEMISTRY (PRACTICAL) 2 CREDITS

1. Qualitative analysis of carbohydrates (monosaccharides, Disaccharides, polysaccharides)
2. Quantitative estimation of Sugars (Glucose, lactose, starch)
3. Estimation of acid value, iodine value, saponification value of fats
4. Estimation of blood Glucose
5. Estimation of serum triglyceride and cholesterol
6. Estimation of plasma protein

REFERENCE BOOKS/JOURNALS:

11. Fundamentals of Biochemistry- A. C. Deb
12. Lipincott’s Illustrated Reviews- Biochemistry by Richard Harvey & Denise Ferrier

**CC-4-Th: ADVANCED HUMAN PHYSIOLOGY 4 CREDITS**

1. Lymphatic systems-Lymph glands and its functions spleen-structure and functions.
2. Respiratory system:
   a) Organs of respiration-nose, larynx, trachea, bronchi, lungs and its capacity-structure and functions.
   b) Mechanism of respiration-Chemical respiration-Tissue respiration.
   c) Common diseases like TB, Asthma, Pleurisy, Cough, hiccups.
3. Excretory system:
   a) Organs, structure and functions of Kidney, ureter, urinary bladder
   b) Formation of urine, comparison of normal urine, Abnormal constituents of urine and diseases associated with it, Nephritis, Nephrosis, Renal stones. Significance of urine examination.
4. Other sense organs:
   a) Eye-structure and functions, physiology of vision, Defects in vision-Myopia and Hypermetropia, Common diseases of the eye-Conjunctivitis, Trachoma, Cataract.
   b) Ear-structure and functions, Mechanism of hearing, Common ear diseases-deafness, vertigo, motion sickness.
5. Reproductive system:
   a) Female reproductive organs: structure and functions-ovary, fallopian tubes, uterus, vagina, external generation.
   b) Male reproductive organs: structure and functions-testis, vas deferens, urethra, penis, prostate glands.
   c) Menstruation, puberty, menopause, Fertilisation of ovum with sperm, Development of fertilized ovum, placenta and its function, Parturition.
6. Endocrine system:
   a) Hormones-endocrine glands-their structure and functions. a) pituitary b) thyroid c) parathyroid d) adrenal e) hormones of reproduction) prostaglandin
   b) Endocrine system-disorders of over and their under secretion.
c) Control of homeostasis

CC-4-P: ADVANCED HUMAN PHYSIOLOGY (PRACTICAL) 2 CREDITS

1. Fresh mount of blood, stained blood smear-study under microscope.
2. Estimation of haemoglobin-Sahli’s method.
3. RBC count, WBC count (total and differentiation).
4. Determination of ESR.
5. Effect of exercise on pulse rate and respiration.
6. Histology of epithelial, connective, muscular and nervous tissue.
7. Identification of the prepared slides-Trachea, Lung section, Kidney, Skin, Artery and Vein.

REFERENCE BOOKS/JOURNALS:
7. Lipincott’s Illustrated Reviews- Physiology by Richard Harvey & Denise Ferrier.

THIRD SEMESTER

CC-5-Th: NUTRITIONAL BIOCHEMISTRY -II 4 CREDIT

1. Major metabolic pathways:
   a) Carbohydrate metabolism: digestion, absorption, glucose transport, glycolysis, metabolism of lactate and pyruvate, citric acid cycle, gluconeogenesis, pentose phosphate pathway.
   b) Lipid metabolism: digestion, absorption, intestinal resynthesis of triglycerides, transport oxidation of fatty acids, biosynthesis of fatty acids, mobilization of fat, ketogenesis, metabolism of phospholipids, glycolipids and cholesterol (in brief)


4. Inborn errors of metabolism (in brief)
1. Analysis of amino acids
2. Qualitative analysis of proteins
3. Estimation of serum lipoprotein
4. Estimation of serum creatinine
5. Estimation of serum urea
6. Estimation of serum iron, phosphorus, calcium, vitamin D

**REFERENCE BOOKS/JOURNALS:**

**CC-6-Th: ADVANCED NUTRITION**

1. Minerals-functions, sources, bio-availability, requirement, deficiency & toxicity of following minerals-calcium, iron, iodine, fluorine, sodium, potassium
2. Vitamins-classification, units of measurement, sources, functions, deficiency and toxicity of following vitamins:
   a) Fat soluble vitamins: Vitamin A, Vitamin D, Vitamin E, Vitamin K
   b) Water soluble vitamins: Ascorbic acid, Thiamine, Riboflavin, Niacin, Other member of B complex such as B6, Folic acid and B12.
3. Nutrition in common inborn errors of metabolism

CC-6-P: ADVANCED NUTRITION (PRACTICAL)  2 CREDITS

1. Determination of Ash content in food
2. Determination of Moisture content in food
3. Determination of calcium, iron, and Vitamin C content in foods

REFERENCE BOOKS/JOURNALS:
3. Indian Council of Medical Research Nutrient Requirements and Recommended Dietary Allowances for India, A Report of the Expert Group of the Indian Council of Medical Research, New Delhi; ICMR.

CC-7-Th: FOOD COMMODITIES  4 CREDITS

1. Cereals and pulses: Cereals and millets, breakfast cereals, cereal products, structure processing, use in variety of preparations, selections, variety storage, nutritional aspects. Pulses and legumes production (in brief). Selection and variety, storage, processing, use in variety of preparations, nutritional aspects.
2. Milk and milk products: Composition, classification, quality processing, storage, spoilage, uses, nutritional aspects of milk, curds, butter milk, paneer, khoa, cheese, ice-cream, kulfi and various kinds of processed milk.

3. Eggs: Composition, grade, quality, selection, storage, spoilage, uses and nutritional aspects.

4. Fish, Poultry and meat: Selection, storage, uses and nutritional aspects, spoilage of fish, poultry and meat.

5. Vegetables and fruits: Variety, selection, purchase, storage, availability, uses and nutritional aspects of raw and processed vegetables and fruits.


7. Food adjuncts: essences, food colors - origin, classification, description, uses, specifications, procurement and storage.

8. Tea, coffee, chocolate and coco powder, aerated beverages, juices - Processing, cost and nutritional aspects.

**CC-7-P: FOOD COMMODITIES (PRACTICAL) 2 CREDITS**

1. Detection of starch, sucrose, sucrose, formalin, boric acid, and urea in milk.
2. Detection of urea in puffed rice.
3. Detection of Khesari flour in besan.
4. Detection of Vanaspati in Ghee/Butter.
5. Detection of Metanil yellow in turmeric/coloured sweet products.
7. Detection of artificially colour / foreign matter in tea (dust/leaves).

**REFERENCE BOOKS/JOURNALS:**

1. B. Srilakshmi : Food Science
5. Foods Facts and Principles- S. Manay

**CC-8-Th: FOOD MICROBIOLOGY 4 CREDITS**

1. Introduction to microbiology and its relevance to everyday life-general morphology of microorganisms-general characteristics of bacteria, fungi, virus, protozoa, algae.

2. Control of microorganisms-growth curve-effect of environmental factors on growth of microorganisms-pH, water activity-oxygen availability, temperature and others.
3. Microbiology of different foods—spoilage and contamination—sources, types, effects on the following:
   a) Cereals and cereal products.
   b) Sugar and sugar products.
   c) Vegetables and fruits.
   d) Meat and meat products.
   e) Fish and other sea foods.
   f) Eggs and poultry.
   g) Milk and milk products.
   h) Canned foods.

4. Environmental microbiology—water, air, soil and sewage.

5. Microbial intoxications and infections—sources of contamination of foods, toxin production and physiological action. Sources of infection of foods by pathogenic organisms—symptoms and method of control.


7. Relevance of microbiological standards for food safety.

FOURTH SEMESTER

CC-8-P: FOOD MICROBIOLOGY (PRACTICAL) 2

CREDITS

1. Steam sterilization of laboratory glass wares, media etc.
3. Inoculation and growth of microorganisms.
4. Staining of organism and study of morphology of bacteria and fungi under light microscope.
5. Test for proper pasteurization of milk and milk products.
6. Identification of bacteria in foods (e.g. bread, vegetables, cheese).
7. Identification of water borne organism like coli form, Salmonella etc by simple biochemical tests.

REFERENCE BOOKS/JOURNALS:

4. Bamrart George J, Basic food Microbiology, CBS Publication, New Delhi,
5. Jay JM, Modern Food Microbiology, CBS Publication New Delhi 3rd Ed.
10. Joshi, Biotechnology: Food Fermentation Microbiology, Biochemistry & Technology, Vol II

CC-9-Th: FAMILY MEAL MANAGEMENT 4 CREDITS
1. Introduction to meal management - balanced diet – food guide – basic five food groups.
2. Basic principles of meal planning objectives – steps in meal planning, food cost.

CC-9-P: FAMILY MEAL MANAGEMENT 2 CREDITS
1. Elementary idea of weight and measure.
2. Planning and preparation of diet for adult man and woman during different physical activities and different cost.
5. Preparation of diet for a preschool and school child.
REFERENCE BOOKS/ JOURNALS

2. B. Srilakshmi- Dietetics, 7th ed
7. Indian Council of Medical Research : Nutrient Requirements and Recommended Dietary Allowance for Indians, New Delhi.

CC-10-Th: DIETETICS-I


2. Routine hospital diets – regular diet, light diet, soft diet, and full fluid diet.
   I. Oral Feeding
   II. Tube Feeding
   III. Parenteral Nutrition
   IV. Intravenous Feeding

3. Diet and drug interactions.


5. Causes, complications, heath effect and dietary treatment of obesity and leanness.


7. Diet in disturbances of the small intestine and colon:
   I. Diarrhea (child and adult), classification, modification of diet.
   II. Constipation and flatulence – dietary consideration.
   IV. Dietary treatment of disaccharide intolerance and coeliac disease.

CC-10-P: DIETETICS-I (PRACTICAL) 2 CREDITS

1. Planning and preparation of liquid diet, soft diet, high and low calorie diet with modified fat and carbohydrate level.
2. Planning and preparation peptic ulcer.
3. Planning and preparation of low and medium cost diet for PEM, anaemia and vitamin A deficiency.
4. Planning and preparation of diet with modified:
   (a) Consistency,
   (b) Fibre and residue,
   (c) Diet for diarrhoea.

REFERENCE BOOKS/ JOURNALS
1. B. Srilakshmi- Dietetics, 7th ed
7. Raheena, Begum: A textbook of food, nutrition and dietetics Sterling Publishers, New Delhi

FIFTH SEMESTER

CC-11-Th: DIETETICS-II 4 CREDITS

1. Diet in surgical conditions, burns, cancer, infection and fever. Diet in influenza, typhoid fever, recurrent malaria and tuberculosis.

2. Diet in diseases of the liver and gall bladder: Etiology, symptoms and dietary treatment in jaundice, hepatitis, cirrhosis of liver and hepatic coma. Dietary treatment in cholecystitis and cholelithiasis and pancreatitis.


CC-11-P: DIETETICS-II (PRACTICAL) 2 CREDITS
Planning and preparation of diet for influenza, cancer, jaundice, viral hepatitis, cirrhosis of liver, hypertension, atherosclerosis, Diabetes mellitus, nephritis, nephritic syndrome.

REFERENCE BOOKS/ JOURNALS
1. B. Srilakshmi- Dietetics, 7th ed
2. Krause's Food & the Nutrition Care Process by L. Kathleen Mahan, Janice L Raymond, 14th ed.

CC-12-Th: QUANTITY FOOD PRODUCTION & SERVICE 4 CREDITS
1. Aims and objectives of different food service outlets, (a) Industrial, (b) Institutional, (c) Hospitals.
2. Different food and beverage outlets.
3. Menu planning – sequence of course- Indian (regional i.e. North Indian, South Indian, East Indian, and Gujratis, Western and others. Technique of writing menus (give exercises for planning menus)
4. Types of meals – and styles of service – breakfast, lunch, dinner, afternoon tea, snacks (table d’hôte and a’la carte menu).

5. Beverages, alcoholic and non-alcoholic hot and cold. Classification of beverages, use and importance in meals and snacks. Suitable glassware for beverage service and five types of services of food and beverages.

6. Staff organization of different outlets (a’la carte and table d’hôte), manager, hostess, supervisor, steward, waiter.

**CC-12-P: QUANTITY FOOD PRODUCTION & SERVICE (PRACTICAL) 2 CREDITS**

1. Rice preparation – Plain and Fried rice, Pulao, tomato rice, biryani (mutton or chicken).
3. Pulse preparation – dalfry, dal makhani, keema ghugni, sambar/rasam, gujrati dal, rajmah/chole
4. Vegetable preparation – Alumotor, alupalak, damalu, vegetable kofta, vegetable korma, palak paneer.
5. Fish and meat preparation – Fish-curry, mutton roghanjosh, palak-chicken.
7. Snacks – Variety of sandwiches, vegetable puffs, fish fry/finger, steamed momo, idli.
8. Sweets – Kheer, burfi, sandesh, gulabjamun, halwa.
10. Entrees – Vegetable pie, vegetable burger, hamburger.
11. Vegetable – Baked cauliflower, savory vegetables, baked stuffed capsicum, vegetable and Mutton-patties.

**REFERENCE BOOKS/ JOURNALS:**

SIXTH SEMESTER

CC-13-Th: ENTERPRENEURSHIP DEVELOPMENT 6 CREDITS

1. Definition of Entrepreneurship, Entrepreneur, features of Entrepreneurship, functions of Entrepreneurship, Entrepreneurship & Creativity, Definition of Innovation, Personal Ethics in Business
2. Evolution of Entrepreneurship in India, Different forms of Entrepreneurship, Small business Entrepreneurship, Role of small business Entrepreneurship in Indian Economy, Problems of small business Entrepreneurship in India, Market survey techniques, marketing strategies

REFERENCE BOOKS/ JOURNALS:
1. Vasant Desai, Dynamics of Entrepreneurial Development and Management
2. Arya Kumar, Entrepreneurship
4. C B Gupta, Entrepreneurship Development in India
5. SS Khanka, Entrepreneurial Development
7. Stephen R. Covey; The seven habits of highly effective people
8. Entrepreneurship Development by Dilip Gangopadhyay
9. Entrepreneurial Development by Dr. S.S. Khanka – Chand publication

CC-14-Th: COMMUNITY NUTRITION 4 CREDITS

1. Concept of Community, types of Community, Factors affecting health of the Community
2. Nutrition and health in national development.
3. Nutritional problems confronting our country – the causes of malnutrition in India – balance between food and population growth.
4. Nutrition intervention scheme in the community, lecture and method demonstrations, nutrition exhibitions and visual aids.
5. Nutritional intervention programmes to combat malnutrition.
6. Biochemical estimation of nutritional status

7. Indirect assessment of nutritional status: food balanced sheets and agricultural data, ecological parameters and vital statistics

8. Audio visual and visual aids used for community education.

9. Regional, National and International agencies in community nutrition. ICDS, IGMSY, SABLA, Akshaypatra, SNP, ANP, MIDDAY MEAL PROGRAM, FAO, WHO, UNICEF, CARE, AID, ICMR, ICAR, NIN, CFTRI.

10. Recent advances in community nutrition research – fortification, enrichment of foods.

CC-14-P: COMMUNITY NUTRITION (PRACTICAL) 2 CREDITS

On job training at a N.G.O. like CINI CHETNA/ICDS project centre of Health centre where nutritionist works.

**DURATION:** 2-3 weeks

**ATTENDENCE AND PARTICIPATION:** A daily diary is to be maintained by the student. A certificate to be issued to the individual student by the Head of the Institute/Organisation duly endorsed by the teacher guide and countersigned by the principal/Co-ordinator of the Institution/organisation where on the job training take place.

A confidential report to be issued to the convener of the course of the parent institution covering the following aspects.

| a. Attendance and punctuality                      | Marks : 2 |
| b. Attitude and Co-operation                       | Marks : 4 |
| c. Knowledge and Report/Project                    | Marks : 10|
| d. Application of performance                      | Marks : 4 |

**PRESENTATION OF REPORT:**

a) Duplicate copies of report/Project to be submitted by the student.
b) Volume of the report/Project as required.
c) Report/Project may be neatly hand written/typed.
d) Report/project must be submitted in bound form.

Reports of all sectors/branches of on-the-job training undergone by the students to be submitted to the convener before the candidates are sent up for university examination.

**EVALUATION:** Evaluation to be made jointly by Internal and External examiners of the subject concerned.
DISTRIBUTION OF MARKS:

<table>
<thead>
<tr>
<th>MARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Written report /Project                                            60%</td>
</tr>
<tr>
<td>b) Computation of Marks allotted by different organisation/ Institution where on-job training take place 20%</td>
</tr>
<tr>
<td>c) Viva                                                               20%</td>
</tr>
</tbody>
</table>

REFERENCE BOOKS/ JOURNALS


DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE

DSE-A


DSE-A-5-1-Th: DIET COUNSELING AND PATIENT CARE 4 CREDITS

1. Introduction to term Dietician: Definition of Dietician, Difference between registered dietician & Nutritionist
2. Role of dietician in hospital: work area of hospital dietician, role of dietician in hospital
3. Role of dietician in community: work area of community dietician, role of community dietician
4. Introduction to Nutrition Care Process: Definition of Nutrition Care Process. Steps of Nutrition Care Process
5. Nutrition Assessment: Definition, Nutrition assessment component, Critical thinking
7. Nutrition diagnosis component nutrition vs. medical diagnosis
8. Nutrition Interventions: Definition and objectives

DSE-A-5-1-P: DIET COUNSELING AND PATIENT CARE (PRACTICAL) 2 CREDITS

Visit to and training at hospital/ nursing home/ medical college/ clinic where dietitians work
- Taking Case history and study
- Routine Hospital diet
- Distribution of food from kitchen to individual patient with specific diet.
• Dietary management of patient in different diseases and diet chart for the particular patient.
• Role of dietitian/nutritionist in diet counselling

DURATION: 21 days

ATTENDANCE AND PARTICIPATION: A daily diary is to be maintained by the student. A certificate to be issued to the individual student by the Head of the Institute/Organisation duly endorsed by the teacher guide and countersigned by the principal/Co-ordinator of the Institution/organisation where on the job training take place.

A confidential report to be issued to the convener of the course of the parent institution covering the following aspects.

1. Attendance and punctuality Marks : 2
2. Attitude and Co-operation Marks : 4
3. Knowledge and Report/Project Marks : 10
4. Application of performance Marks : 4

PRESENTATION OF REPORT:
1. Duplicate copies of report/Project to be submitted by the student.
2. Volume of the report/Project as required.
3. Report/Project may be neatly hand written/typed.
4. Report/project must be submitted in bound form.

Reports of all sectors/branches of on-the-job training undergone by the students to be submitted to the convener before the candidates are sent up for university examination.

EVALUATION: Evaluation to be made jointly by Internal and External examiners of the subject concerned.

DISTRIBUTION OF MARKS:

a) Written report/Project 60%
b) Computation of Marks allotted by different organisation/Institution where on-job training take place 20%
c) Viva 20%

REFERENCE BOOKS/ JOURNALS

DSE-A-5-2Th: CLINICAL ASSESSMENT AND COUNSELING OF PATIENT 4 CREDITS
1. Introduction to term Dietician: Definition of Dietician, Difference between registered dietician & Nutritionist
2. Role of dietician in hospital: work area of hospital dietician, role of dietician in hospital
3. Role of dietician in community:- work area of community dietician, role of community dietician
4. Introduction to Nutrition Care Process: Definition of Nutrition Care Process. Steps of Nutrition Care Process
5. Nutrition Assessment:-Definition, Nutrition assessment component, Critical thinking
7. Nutrition diagnosis component nutrition vs. medical diagnosis
8. Nutrition Interventions: Definition and objectives

DSE-A-5-2-P: CLINICAL ASSESSMENT AND COUNSELING OF PATIENT
2 CREDITS
  1. Detailed study of a patient case (medical records, prescription, anthropometry, diet, etc.)
  2. Evaluation of the patient’s condition
  3. Counseling and intervention
  4. Result analysis
  5. File submission and Presentation

REFERENCE BOOKS/ JOURNALS

DSE-A-6-3-Th: GERIATRIC NUTRITION
4 CREDITS
  1. Definition of ageing, senescence, old age or aged people, gerontology, geriatrics, and Geriatric nutrition. Classification of old population.
  2. Physiological and biochemical changes during old age.
  3. Assessment of nutritional status of older adults.
  4. Nutritional requirements and general dietary guidelines for elderly.
  5. Major nutritional and health problems during old age.

DSE- A-6-3-P: GERIATRIC NUTRITION (PRACTICAL)
2 CREDITS
  1. Visit to old- age homes- assessment of nutritional status of old people, diet counseling.
  2. Preparation of dishes suitable for older person- soft, semisolid, easily digestible, nutritious and calorie dense balanced diet.
REFERNCE BOOKS/ JOURNALS
3. Insel PM, Turner RE and Ross D (2004): Nutrition, Jones & Bartlett Learning,
7. Dietetics by B Srilakshmi
8. Clinical Nutrition and Dietetics by F. P. Antia and Philip Abraham

DSE-A-6-4-Th: ASSESSMENT OF NUTRITIONAL STATUS IN COMMUNITY
4 CREDITS
2. Diet survey: Need and importance, methods of dietary survey, Interpretation - concept of consumption unit, individual and total distribution of food in family, adequacy of diet in respect to RDA, concept of family food security.
3. Clinical Signs: Need & Importance’s, identifying signs of PEM, vitamin A deficiency and iodine deficiency, Interpretation of descriptive list of clinical signs
4. Nutritional anthropometry: Need and importance, standard for reference, techniques of measuring height, weight, head, chest and arm circumference, interpretation of these measurements. Use of growth chart.

DSE-A-6-4-P: ASSESSMENT OF NUTRITIONAL STATUS IN COMMUNITY
2 CREDITS
1. Anthropometric measurement of children- height, weight, MUAC, BMI
2. Growth chart- plotting of growth charts, growth monitoring and promotion.
3. Comparison with norms and interpretation of the nutritional assessment data and its significance. Weight for age, height for age, weight for height, Z scores, standard deviations, percentiles
5. Clinical assessment and signs of nutrient deficiencies specially PEM (Kwashiorkor, marasmus), vitamin A deficiencies, Anaemia, Rickets, B-Complex deficiencies.
6. Estimation of food and nutrient intake: Household food consumption data, adult consumption unit, 24 hours dietary recall 24 hours record, Weighment method, food diaries, food frequency data, use of each of the above, information available through each individual, collection of data, estimation of intakes.
REFERENCE BOOKS/JOURNALS:
1. Nutrition Science: B Srilakshmi

DSE-B

(Any one from DSE-B-5-1/DSE-B-5-2 in semester-5 and any one from DSE-B-6-3/DSE-B-6-4 in semester-6)

DSE-B-5-1-Th: FOOD SERVICE EQUIPMENT AND LAYOUT 4 CREDITS
1. Introduction to basic and special equipment for food production and service. Factor for selection of equipment – electrical and non-electrical equipments for storage, preparation, food serving, dishwashing, and laundering , cleaning of the equipment, care and use of the equipment- cutlery, glass and silver.
2. Basic concept, safety consideration, electrical, parts and wiring to suit installation and use of different kinds of equipments.
4. Planning food service unit: Layout of food plants, plans of area of food (preparation), cooking, cleaning, storing, serving and dining, different working centres. Their sizes and finishes, storage units, lighting and ventilation, working weight in relation to equipment, selection and their relationship. Municipal rules and legislation – outsider revision.
5. Management and sanitation of kitchen, food production plant and equipment. Maintenance, sanitation of plant, safety, security, garbage disposal (solid and liquid waste), pest control.

DSE-B-5-1-P: FOOD SERVICE EQUIPMENT AND LAYOUT 2 CREDITS
1. Table setting, napkin folding-different techniques
2. Setting up the restaurant – laying of table cloth, changing, setting up the silvers and other table.
4. Laying for break-fast.
5. Tray service.
6. Order taking, making our checks bills, presentations of bills.
7. Up keep and cleaning of cutlery, crockery and other equipment.

REFERENCE BOOKS/JOURNALS:
1. Food Service Operations, Mahmood A. Khan Avi Publication Co. 1987
2. Table Layout and Decoration, Dorothy Tompkins, Ward Lock Co. Ltd, 1969

DSE-B-5-2Th: FOOD SANITATION AND HYGIENE

CREDITS
2. Other food hazards – chemicals, antibiotics, hormones, metal contamination-poisonous foods.
3. Food contamination- sources and transmissions. Water, air, sewage and soil as reservoirs of infection and ways of spread. Other agents of contamination- Humans, domestic animals, vermins, birds.
4. Importance of personal hygiene of food handler - habits -clothes, illness. Education of food handler in handling and serving food.
5. Safety in food procurement, storage, handling and preparation – control of spoilage – safety of left over foods.
7. Control of infestation: rodent control- rats, mice; vector control- use of pesticides
8. Food sanitation, control and inspection-planning and implementation of training programme for health personnel.

DSE-B-5-2-P: FOOD SANITATION AND HYGIENE

CREDITS
1. Study of personal and environmental hygiene habits of street food handlers. Intervention and result analysis. Project submission and presentation.
2. Preservation of fruits and vegetables for later use-peas, carrots, cauliflower, chutney, soup, pickle, jam, jelly, marmalade, squash.

REFERENCE BOOKS/ JOURNALS:
2. Food Hygiene and Sanitation by S. Roday
3. Essentials of food safety and sanitation by David Ms Swane, Nancy Rue and Richard Linton
4. Essentials of Food Sanitation by Marriott, Norman
5. Food Safety, Sanitation and Personal Hygiene by BC Cook Articulation Committee and The BC Cook Articulation Committee
DSE-B-6-3-Th: BAKERY SCIENCE  
1. Introduction and scope of bakery science.
2. Common bakery terms
3. Flours: Constituents of flour, water absorption power, gluten, grades of flour.
4. Raw materials required for bread and cake making.
5. Role of flour, water, yeast, salt, sugar, milk and fats in bakery.
6. Bread and cake making process.
7. Bread improver.
8. Knowledge of oven and baking temperatures.
9. Preparation of basic cookies, biscuits and pastries

DSE-B-6-3-P: BAKERY SCIENCE (PRACTICAL)  
1. Preparation of 
   • Bread-plain and stuffed
   • Cookies- pinwheel, nan khatai
   • Cakes–plain, fruit and chocolate cake, Different type of icings.
2. Visit to and training at Bread/biscuit/cake/pastry Industry for 15 days.
   • Development of concept on materials used, machineries, technology involved, production, packaging, shelf life and marketing of finished products
   • File preparation and submission.

REFERENCE BOOKS/ JOURNALS

DSE-B-6-4 : DISSERTATION/ PROJECT  
1. General outline about how to conduct research work on a particular topic- data collection, compilation, report submission, seminar presentation & evaluation.

SKILL ENHANCEMENT COURSE (SEC)

SEC-A(Any one in Semester-3)

SEC-A-3-1Th: FOOD PRESERVATION  
1. Food preservation: definition, objectives and principles of food preservation. Different methods of food preservation.
2. Preserved Products: Jam, Jelly, Marmalade, Sauces, Pickles, Squashes, Syrups-types, composition and manufacture, selection, cost, storage, uses and nutritional aspects.

3. Sugar and sugar products: Different forms of sugar (sugar, jaggery, honey, syrup), selection, storage and use, preserves.

4. Fats and Oils: Types and sources of fats and oils (animal and vegetable), processing, uses, storage and nutritional aspects.

5. Raising agents: preservation method.


7. Convenience foods: Role, types, advantages, uses, cost and contribution to diets, fast food.

8. Salts: Types, uses in the diet.

REFERENCE BOOKS/JOURNALS:

SEC-A-3-2-Th: MARKET SURVEY ON FOOD COMMODITIES 2 CREDITS
Market survey on nutritional significance, cost, consumer acceptability, availability in the local market:
1. Cereal and pulse based food.
2. Fats and oils (conventional and unconventional)
3. Fast food, convenience food, junk food,
4. Frozen food, processed vegetables, processed meat &fish
5. Health drinks
6. Beverages

SEC-B(Any one in Semester-4)

SEC-B-4-1-Th: FOOD SAFETY AND QUALITY CONTROL 2 CREDITS
1. The relationship of microorganisms to sanitation, Effects of microorganisms on food degradation and food-borne illnesses.
2. Importance of personal hygiene of food handlers: Habits, clothes, illness, education of food handler in handling and serving food. Concept of food contamination.
3. Food Safety: Definition and factors affecting food safety, safety of left over foods. Control of Food spoilage.

REFERENCE BOOKS/JOURNALS:

SEC-B-4-2-Th: HUMAN DEVELOPMENT 2 CREDITS

1. Human development and the need to study it;
2. Roles of heredity and environment in human development;
3. Concepts of growth and development; growth velocity; the life span approach to human development.
4. Conception; physical and psychological care of the expectant mother; prenatal development.
5. Birth of the baby – the characteristics of the neonate; care of the neonate. Infancy – highlights of growth and development, growth pattern of immature infants ; caring for the infant – feeding, weaning, supplementary feeding ; sleep routine ; bathing and clothing ; immunization schedule.
6. Growth pattern for adolescents
7. Highlights of development in childhood, adolescence, adulthood and old age.

REFERENCE BOOKS/JOURNALS: