**Kurukshetra UniversityKurukshetra**

**(Established by the State Legislature Act XII of 1956; ‘A+’ Grade, NAAC Accredited)**

**Model Curriculum for**

**Bachelor of Technology (B.Tech.) in Food Technology**

**General, Course Structure &Scheme&Semester-Wise Credit Distribution**

**(Credit-Based Scheme of Studies/Examination ((2018-19 Onwards in Phased Manner))**

**A. Definition of Credit:**

|  |  |
| --- | --- |
| 1 Hour Lecture (L) per week | 1 credit |
| 1Hour Tutorial (T) per week | 1 credit |
| 1 Hour Practical (P) per week | 0.5 credit |
| 2 Hours Practical (Lab) per week | 1 credit |

**B. Range of credits:**

A total credit of about 160 is required for a student to be eligible to get Under Graduate degree in Food Technology. A student will be eligible to get Under Graduate degree (B.Tech.) with Honours, if he/she completes an additional 20 credits.These could be acquired through MOOCsatSwayam portal or with in-house examination being conducted. In order to have an Honours degree, a student may choose minimum 20 credits provided that the student must ensure the course is approved by the Competent Authority, Government of India.

**Bachelor of Technology (Food Technology)**

**Credit-Based**

SCHEME OF STUDIES/EXAMINATIONS

**Semester – III**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S. No. | Course No. | Course Title | Teaching Schedule | | | | Credits | Allotment of Marks | | | | Duration of Exam  (Hrs.) |
| L | T | P | Hours/Week | Major Test | Minor Test | Practical | Total |
| 1 | FTT-201A | Food Microbiology | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 2 | FTT-203A | Food chemistry | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 3 | FTT-205A | Unit Operation In Food Engg. – I | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 4 | FTT-207A | Food processing | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 5 | FTT -211L A | Food Microbiology Lab | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 6 | FTT – 213LA | Food chemistry Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 7 | FTT – 215 LA | Unit Operation In Food Engg. - I Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 8 | FTT – 217 LA | Food processing Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
|  |  | **Total** | **15** | **0** | **9** | **24** | **19.5** | **375** | **245** | **180** | **800** |  |
| 9 | FTT-219A | Industrial Training-I | 2 | 0 | 0 | 2 | - | - | 100 | - | 100 | - |
| 10 | \*MC-902LA | Constitution of India | 3 | 0 | 0 | 3 |  | 75 | 25 | 0 | 100 | 3 |

**Note:** FTT-219 A is a mandatory credit less course in which the studentstobeevaluated for the industrial training undergone after 2nd semester and students will be required to get passing marks to qualify.

**\*MC-902A** is a mandatory credit less course in which the student will be required to get passing marks in the major test.

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SCHEME OF STUDIES/EXAMINATIONS

**Semester – IV**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S. No. | Course No. | Course Title | Teaching Schedule | | | | Credits | Allotment of Marks | | | | Duration of Exam  (Hrs.) |
| L | T | P | Hours/Week | Major Test | Minor Test | Practical | Total |
| 1 | FTT-202A | Human Nutrition | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 2 | FTT- 204A | Thermal Processing | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 3 | FTT – 206A | Unit Operation In Food Engg. – II | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 4 | FTT- 208 A | Dairy Technology | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 5 | FTT-210A | Fruit and Vegetable Processing | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 6 | FTT- 214LA | Thermal Processing Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 7 | FTT -216LA | Unit Operation In Food Engg. - II Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 8 | FTT-218LA | Dairy Technology Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 9 | FTT-220LA | Fruit and Vegetable Processing Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
|  |  | **Total** | **15** | **0** | **12** | **27** | **21** | **375** | **285** | **240** | **900** |  |
| 10 | MC-901A\* | Environmental Sciences\* | 3 | 0 | 0 | 3 |  | 75 | 25 | 0 | 100 | 3 |

**\*MC-901A**is a mandatory credit less course in which the student will be required to get passing marks in the major test.

**Note:**All the students have to undergo 4-6 weeks industrial training after IV semester and to be evaluated in V semester.

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SCHEME OF STUDIES/EXAMINATIONS

**Semester – V**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Course No.** | **Course Title** | **Teaching Schedule** | | | | **Credits** | **Allotment of Marks** | | | | **Duration of Exam(Hrs.)** |
| **L** | **T** | **P** | **Hours/Week** | **Major Test** | **Minor Test** | **Practical** | **Total** |
| 1 | FTT – 301A | Dairy product Technology | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 2 | FTT – 303A | Fruit and Vegetable Technology | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 3 | FTT – 307A | Food Engg. | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 4 | FTT – 309A | Industrial Pollution Control | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 5 | FTT – 305A | Food Analysis and Quality Control | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 6 | FTT – 311LA | Dairy product Technology Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 7 | FTT – 313LA | Fruit and Vegetable Technology Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 8 | FTT – 317LA | Food Engg. Lab | 0 | 0 | 2 | 2 | 1.0 | 0 | 40 | 60 | 100 | 3 |
|  | FTT – 315LA | Food Analysis and Quality Control Lab |  |  |  |  |  |  |  |  |  |  |
|  |  | **Total** | **15** | **0** | **10** | **23** | **19** | **375** | **245** | **180** | **800** |  |
| 9 | \*\*MC-903A | Essence of Indian Traditional Knowledge | 3 | 0 | 0 | 3 |  | 100 |  | 0 | 100 | 3 |
| 10 | \*FTT-319A | Industrial Training-II | 0 | 0 | 2 | 2 | 0 | 0 | 100 |  | 100 |  |

**\*\*MC-903A** is a mandatory credit less course in which the student will be required to get passing marks in the major test.

\* FTT-319A is a mandatory credit less course in which the students to be evaluated for the industrial training undergone after 4th semester and students will be required to get passing marks to qualify.

**The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**

The students should select one open Elective Courses (OEC) from the following list.

|  |  |
| --- | --- |
| **Course No.** | **OEC-I\*** |
| ES-201A | Essentials of Information Technology |
| ES-211LA | Information Technology Lab |
|  | |
| ES-213A | Technology Of Plantation Crops |
| ES-215LA | Technology Of Plantation Crops Lab |
|  | |
| MOOC-1A | Any one MOCC course with lab through SWAYAM |

**Bachelor of Technology (Food technology)**

**Credit-Based**

SCHEME OF STUDIES/EXAMINATIONS

**Semester – VI**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Course No.** | **Course Title** | **Teaching Schedule** | | | | **Credits** | **Allotment of Marks** | | | | **Duration of Exam**  **(Hrs.)** |
| **L** | **T** | **P** | **Hours/Week** | **Major Test** | **Minor Test** | **Practical** | **Total** |
| 1 | FTT-302A | Technology Of Cereals, Pulses, & Oil Seeds | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 2 | FTT-304A | Meat, Fish, Poultry Technology | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 3 | FTT-306A | Packaging Technology | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 4 | FTT-308A | Food Biotechnology | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 5 | FTT-310A | Bio Chemical Engg. | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 6 | FTT-312LA | Technology Of Cereals, Pulses, & Oil Seeds Lab | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 7 | FTT- 314LA | Meat, Fish, Poultry Technology Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 8 | FTT- 318LA | Food Biotechnology Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 9 | FTT- 320LA | Bio Chemical Engg Lab. | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
|  |  | **Total** | **18** | **0** | **9** | **27** | **22.5** | **450** | **270** | **180** | **900** |  |

**Note:**All the students have to undergo 4-6 weeks industrial training after VI semester and it will be evaluated in VII semester.

The students should select two open Elective Courses (OEC) from the following list.

**The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **OEC-II** |  | **Course No.** | **OEC-II** |
| OEC-FT-302A | Health Foods |  | OEC-FT-322A | Types Of Fats and Oils |
| OEC-FT-318A | Plant Maintain Safety and Hygeine |  | MOOC-2A | Anyone MOOC through SWAYAM |
| OEC-FT-320A | Food Marketing, Branding and Advertising |  |  |  |

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**Credit-Based**

SCHEME OF STUDIES/EXAMINATIONS

**Semester – VII**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S. No. | Course No. | Course Title | Teaching Schedule | | | | Credits | Allotment of Marks | | | | Duration of Exam  (Hrs.) |
| L | T | P | Hours/Week | Major Test | Minor Test | Practical | Total |
| 1 | FTT-401A | Utilization Of Industrial Waste and By Products | 2 | 1 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 2 | FTT -403A | Food Processing Plant Layout and Design | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 3 | FTT- 405A | Tech. Of Spices, Herbs and Food Additives | 2 | 1 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 4 | FTT- 407 A | Bakery Confectionay Technology | 2 | 1 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 5 | FTT- 411LA | Utilization Of Industrial Waste and By Products Lab | 0 | 0 | 3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 6 | FTT 413LA | Tech. Of Spices, Herbs and Food Additives Lab | 0 | 0 | 8 | 3 | 4.0 | 0 | 100 | 100 | 200 | 3 |
| 7 | FTT- 415LA | Bakery Confectionay Technology Lab | 0 | 0 | 8 | 3 | 4.0 | 0 | 100 | 100 | 200 | 3 |
|  |  | **Total** | **9** | **3** | **11** | **21** | **17.5** | **300** | **240** | **160** | **700** |  |
| 8 | \*FTT-409A | Industrial Training (Viva-Voce)\*\*\* | 0 | 0 | 2 | 2 | - | 0 | 0 | 100 | 100 |  |

**The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **\*PE-I** |  | **Course No.** | **\*PE-II** |
| FTT-411A | Heat & Mass Transfer | FTT-417A | Technologies Of Beverages |
| FTT-413A | Grains Handling & Storage Technology | FTT-419A | Tech. of Snacks Foods |
| FTT-415A | Food Toxicology | FTT-421A | Statistical Quality Control For Food Industry |

\*\*The project should be initiated by the students in the beginning of VII semester and will be evaluated at the end of the semester on the basis of a presentation and report.

\*FTT-409Ais a mandatory credit less course in which the students to be evaluated for the industrial training undergone after 6th semester and students will be required to get passing marks to qualify.

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SCHEME OF STUDIES/EXAMINATIONS

**Semester – VIII**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S. No. | Course No. | Course Title | Teaching Schedule | | | | Credits | Allotment of Marks | | | | Duration of Exam  (Hrs.) |
| L | T | P | Hours/Week | Major Test | Minor Test | Practical | Total |
| 1 | \*PE-IIIA |  | 2 | 1 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 2 | \*PE-IVA |  | 2 | 1 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 3 | FTT-412A | Food Storage Engg. | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 4 | \*\*OEC-IIIA |  | 3 | 0 | 0 | 3 | 3.0 | 75 | 25 | 0 | 100 | 3 |
| 5 | FTT-416A | Project-II | 0 | 0 | 15 | 11 | 7.5 | 0 | 100 | 100 | 200 | 3 |
|  |  | **Total** | **10** | **2** | **15** | **25** | **19.5** | **300** | **200** | **100** | **600** |  |

**The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**

\*The student should select two Program Elective Courses (PEC) from the following list.

|  |  |  |  |
| --- | --- | --- | --- |
| **Course No.** | **PE-III** | **Course No.** | **PE-IV** |
| BTE-404A | Cold Chain Management | BTE-410A | Food Supply Chain Management |
| BTE-406A | Innovative Techniques In Food Processing | BTE-412A | Enterpreunership Development & Management |
| BTE-408A | Products and Design Development | BTE-414A | Computer Application In Food Technology |

\*The student should select one Open Elective Courses (OEC) from the following list.

|  |  |
| --- | --- |
| **Course No.** | **OEC-III** |
| OEC-FT-418A | Biomedical Electronics |
| OEC-FT-420A | MATLAB & Simulation |
| OEC-FT-422A | History of Science |
| OEC-FT-424A | Internet of things |
| MOOC-3A | Anyone MOOC through SWAYAM |

**Additional Courses for B.Tech. (Honours Degree)**

**Branch/Course: Food Technology**

In order to have an Honours degree, a student may choose 20credits from the following professional electives courses or MOOC through SWAYAM in addition. The student can opt courses offered under MOOCs at Swayam portal from time to time

**Open Elective Course for B. Tech. Students of other Departments**

|  |  |
| --- | --- |
| **Course No.** | **OEC** |
| BTE 401A | Bioinformatics |
| BTE-414A | Bioethics, IPR and Biosafety |