
VIMALA COLLEGE (AUTONOMOUS)

(NAAC Re-accredited (3rd Cycle): A Grade, CGPA-3.50)

(Affiliated to University of Calicut)



DEGREE OF
BACHELOR OF VOCATION (B.Voc)
IN
FOOD PROCESSING
UNDER THE
FACULTY OF HOME SCIENCE

SYLLABUS

(FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2021 – 22 ONWARDS)

VIMALA COLLEGE
ENGINEERING COLLEGE P O, THRISSUR
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1. TITLE

This programme shall be called **Bachelor of Vocation in Food Processing** under Choice Based Credit and Semester System for Undergraduate (UG) Curriculum -2021.

2. PROGRAMME OBJECTIVE

The basic objective of the Programme is to open a channel of admission for vocational courses for students, who have done the 10+2 Science and are interested in food processing as carrier.

The B.Voc courses are designed with the following objectives,

- To provide judicious mix of skills relating to a profession and appropriate content of General Education.
- To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme.
- To provide flexibility to the students by means of pre-defined entry and multiple exit points.
- To integrate NSQF within the undergraduate level of higher education in order to enhance employability of the graduates and meet industry requirements. Such graduates apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
- To provide vertical mobility to students coming out of 10+2 with vocational subjects.

3. PROGRAMME OUTCOMES

Graduates of the programme should be able to

- Skill to innovate, create and exhibit content in a presentable and appealing fashion.
- Good understanding of professional, ethical, security and social issues and responsibilities.
- Capability to engage in continuing professional development and life-long learning.
- Capability to adapt to the evolution of technology and cope with limited resources.
- Apply the knowledge acquired effectively to generate solutions to real-world problems. Manage time and resources efficiently and prioritize tasks to complete within the requested time frame.
- Collaborate as a team and delegate tasks to achieve a specified outcome.
- Confidence to motivate oneself and hone skills based on the knowledge gained.

4. GENERAL PROGRAMME STRUCTURE

Duration:

The duration of the **B.Voc Food Processing** programme shall be 6 semesters distributed over a period of 3 academic years. The odd semesters (1, 3, 5) shall be from June to October and the even Semesters (2, 4, 6) shall be from November to March. Each semester shall have 90 working days inclusive of all examination days distributed over a minimum of 18 weeks of 5 working days

consisting of six hours. Total credits in a semester are 30 (equivalent to 450 hours). For final semester internship and project, total credit is 30 with duration of 900 hrs.

Course:

The B.Voc Programme is designed to bridge the potential skill gap identified. The curriculum in each of the years of the programme would be a suitable mix of General Education Components, Skill Development Components and Ability Enhancement Courses/Audit Courses.

The UG programme shall include General Education Component (Code GEC), Core courses (Code SDC) and Audit courses (Code E).

General Education Components:

- The general education component provides emphasis to Communication skills, Presentation skills, Basic Mathematical Skills, Health and Safety, Industrial Psychology, Entrepreneurship development and other relevant subjects in the field.
- An option for additional language should be provided which enhances the employability outside the state.
- General Education Components should not exceed 40% of the curriculum

The minimum number of courses required for completion of the Diploma in Food Processing is 12, Advanced Diploma in Food Processing is 24 and B.Voc. Food Processing Programme is 36. Total credits in a semester: 30 (equivalent to 450 hours).

A new set of General Education Components shall be developed for BVoc Programmes as Group No. 6. The courses in the group are as follows:

1. A11 - Basic Mathematics and General Awareness
2. A12 - Professional Business Skills
3. A13 - Entrepreneurship Development
4. A14 - Public Health, Sanitation and Safety

Table below shows the list of general courses.

Sl. No.	Semester	Course No.	Course Code	Course Name
1.	1	1.1	A01	ENG1A01
2.		1.2	A02	ENG1A02
3.		1.3	A07(3)	MAL1A07(3) HIN1A07(3)
4.	2	2.1	A03	ENG2A03
5.		2.2	A04	ENG2A04
6.		2.3	A08(3)	MAL2A08(3) HIN2A08(3)
7.	3	3.1	A11	Group No. 1-5 of CBCSS UG 2019
8.		3.2	A12	

9.		4.1	A13	Group No. 6 of CBCSS VUG 2021
10.		4.2	A14	

Ability enhancement courses/ Audit courses

These are courses which are mandatory for a programme but not counted for the calculation of SGPA or CGPA. There shall be one Audit course each in the first four semesters. These courses are not meant for class room study. The students can attain only pass (Grade P) for these courses. At the end of each semester there shall be an examination conducted by the college. The students can also attain these credits through online courses like SWAYAM, MOOC etc. (optional). The list of passed students must be sent to the University from the colleges at least before the fifth semester examination. The list of courses in each semester with credits is given below.

Course with credit	Semester
Environment Studies – 4	1
Disaster Management – 4	2
*Human Rights/Intellectual Property Rights/ Consumer Protection - 4	3
*Gender Studies/Gerontology- 4	4

* Colleges can opt any one of the courses.

Credit System

- A student is required to acquire a total of **180** credits for the completion of the programme which shall be counted for SGPA and CGPA.
- Each semester has a credit of 30. Out of which the general education components shall not exceed 40% of the total credit of each semester.
- The maximum credit for a course shall not exceed 5 and the minimum credit for a course is 2.
- Each subject shall have a certain number of credits assigned to it depending upon the academic load and the nature and importance of the subject.
- The credit associated with each subject will be shown in the prescribed scheme and syllabi. Each course shall have an integer number of credits, which reflects its weightage.
- Audit courses** shall have 4 credits per course and a total of 16 credits in the entire programme. The credits of audit courses or extra credits are not counted for SGPA or CGPA.
- Extra Credits:** The maximum credit acquired under extra credit shall be 4. If more extra credit activities are done by a student that may be mentioned in the grade card. Extra credits are mandatory for the programme. Extra credits will be awarded to students who participate in activities like NCC, NSS, and Swatch Bharath. Those students who could not join in any of the

above activities have to undergo Calicut University Social Service Programme (CUSSP). Extra credits are not counted for SGPA or CGPA.

h. Credit Assessment

- One Credit would mean equivalent of 15 periods of 60 minutes each, for theory, practicals / workshops / IT and tutorials;
- For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops; ie. 1 credit = 30 periods of 60 minutes each.
- For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

i. Grace Marks

Grace Marks may be awarded to a student for meritorious achievements in co-curricular activities such as Sports/Arts/ NSS/NCC/ Student Entrepreneurship.

Attendance:

A candidate shall be permitted to appear for the Semester-End examinations only if she satisfies the following requirements:

- She must secure not less than 75% attendance in the total number of working days in each semester.
- She must earn a progress certificate from the head of the institution stating that she has satisfactorily completed the course of study prescribed in the semester as required by these regulations.
- Her conduct must be satisfactory.

It shall be open to the Controller of Examinations, Vimala College, Thrissur to grant condonation of shortage of attendance on the recommendation of the head of the institution in accordance with the following norms.

- The shortage shall not be more than 10%
- Shortage up to 20% shall be condoned once during the entire course provided such shortage is caused by continuous absence on genuine medical grounds.
- Shortage shall not be condoned more than twice during the entire course.
- Candidate who is not eligible for condonation of shortage of attendance shall repeat the semester as per university norms.

If a student registered in first semester of the B.Voc Programme is continuously absent from the classes for more than 14 working days at the beginning of the semester without informing the authorities the matter shall immediately be brought to the notice of the Principal. The names of such students shall be removed from the rolls.

Readmission

- There shall be provision for Readmission of students in CBCSS VUG 2021.
- The Principal can grant readmission to the student, subject to the conditions detailed below

and inform the matter of readmission to the Controller of Examinations within one month of such readmission.

- This readmission is not to be treated as college transfer.
- There should be a gap of at least one semester for readmission.
- The candidate seeking readmission to a particular semester should have registered for the previous semester examination.
- Readmission shall be taken within two weeks from the date of commencement of the semester concerned.
- For readmission, the vacancy should be within the sanctioned strength in the parent college.
- If change in scheme occurs while readmission, provision for credit transfer is subject to common guidelines prepared by Board of Studies/ Faculty concerned. For readmission to CBCSS VUG 2021 involving scheme change, the Principal concerned shall report the matter of readmission to Controller of Examinations with the details of previous semesters and course undergone with credits within two weeks in order to fix the deficiency/excess papers.

Multiple Entry

The students can discontinue after the successful completion of 2nd semester with Diploma (NSQF Level 5) or 4th semester with Advanced Diploma (NSQF Level 6) and can rejoin to the programme and opt for a lateral entry to 3rd semester or to 5th semester respectively later if wish to do so and can finish their B.Voc Degree with NSQF Level (7). In such cases, the multiple entry shall be completed within 6 years from the date of first registration of the programme.

When Rejoining through multiple entry, the following points to be considered:

1. If rejoining is sought for a student who is the previous student of the same college and in the same programme, the principal / B.Voc Governing Council in the institution can grant the readmission.
2. In all other cases in multiple entry, readmission can be granted only after getting the approval from B.Voc Steering Committee of the university.
3. Rejoining the programme will be allowed to only if the candidate has secured a minimum CGPA of 2.5.
4. The candidate should remit the fees prevailing at that time.

Registration/Re-registration

- a) Each student shall make an online registration for the courses he/she proposes to take within two weeks from the commencement of each semester.
- b) The college shall send a list of students registered for each programme in each semester giving the details of courses registered, including repeat courses, to the University in the prescribed form within 45 days from the commencement of the semester.

- c) A student shall be normally permitted to register for the examination if he/she has required minimum attendance. If the student has a shortage of attendance below 65% in a semester, the student shall be permitted to move to the next semester (if the attendance is more than 50% - Provisional registration) and can write the examination for the entire courses of the semester in which shortage of attendance occurs as supplementary examination only after the completion of the entire programme. If the attendance is less than 50%, the student is ineligible to continue the programme and has to seek readmission. There will not be any Repeat semester in CBCSS VUG2019.
- d) A student who registered for the course shall successfully complete the programme within 6years from the year of first registration. If not, such candidate has to cancel the existing registration and join a fresh as a new candidate.

Rejoining the course

- Rejoining the course will be allowed to only if the candidate has secured a minimum CGPA of 2.5.
- The candidate should remit the fees prevailing at that time.
- B. Voc. governing council will take the decision regarding the rejoining.

College Transfer

College transfer may be allowed for programmes without the change in nomenclature.

5. ADMISSION

Eligibility

- The admission to B.Voc. programme will be as per the rules and regulations of the University for UG admissions.
- Basic eligibility for B.Voc. is 10+2 (Science) and above in any stream (No age limit).
- The eligibility criteria for admission shall be as announced by the University from time to time.
- Separate rank lists shall be drawn up for reserved seats as per the existing rules.
- Grace Marks may be awarded to a student for meritorious achievements in co-curricular activities such as Sports/Arts/ NSS/NCC/ Student Entrepreneurship.
- Preferred subjects and index mark calculations will be decided by the respective Board of Studies.

Diploma Holders

Diploma holders (after 10+2) in the parent courses, approved by the University, who satisfies eligibility criteria can be admitted to the higher diploma (3rd semester) based on the availability of the seats and is under the sole discretion of the principal of the college/ B. Voc. consortium.

Reservation for Vocational Students

25 marks weightage in index mark shall be given to all B.Voc programmes to compute ranking of candidates who successfully completed VHSE/HSE with vocational / NSQF course general to all vocational students at Higher secondary level.

Reservation/Quota

A maximum of 50 students can be admitted to one B.Voc programme. The students can be admitted only to the first semester (except for diploma holders). No students are admitted directly to the Third and Fifth semester in any circumstance except for diploma holders. Diploma holders may be permitted to third semester directly as mentioned above. The reservation rules for B.Voc is the same as that of the regular UG programmes conducted in colleges affiliated to this university.

Fees Structure

1. The course fee and examination fee will be decided by the university.
2. The college can collect Caution deposit, PTA fund, special fees, university fees, sports fee etc. according to the norms provided by the university at the time of admission.
3. If UGC is granting financial assistance for the conduct of programme, it is considered as in aided stream. After the stipulated period of financial aid, with the consent of university /UGC, the college can conduct the same programme in self-financing mode (provided UGC not granting further funds).

Prospectus

The college shall make available to all students admitted a prospectus listing all the courses offered in various departments during a particular semester. The information so provided shall contain the title of the courses, the semester in which it is offered and credits for the courses. Detailed syllabi shall be made available in the college websites.

There shall be a uniform calendar prepared by the college, conduct/schedule of the courses, examinations and publication of results.

6. COURSE EVALUATION

Evaluation (both internal and external) is carried out using mark system. The grading on the basis of total internal and external marks will be indicated for each course and for each semester and for the entire programme;

Credit Point (P) of a course is the value obtained by multiplying the grade point (G) by the

credit (C) of the course: $P = G \times C$

The evaluation scheme for each course shall contain two parts (1) Internal Assessment (2) external Assessment. 20% weight shall be given to the internal evaluation. The remaining 80% weight shall be for the external evaluation.

Internal Assessment

- a) 20% of the total marks in each course are for internal examinations.
- b) The internal assessment shall be based on a predetermined transparent system involving written tests, Class room participation based on attendance in respect of theory courses and lab involvement, records and attendance in respect of Practical Courses.
- c) Internal assessment of the project will be based on its content, relevance, method of presentation, final conclusion and orientation to research aptitude.
- d) Components with percentage of marks of Internal Evaluation of Theory Courses are-

Theory		Practical	
Test paper	40%	Record	40%
Assignment	20%	Lab Involvement	60%
Seminar	20%		
CRP based on attendance	20%		

For the test paper marks, at least two test papers should be conducted. If more test papers are conducted, the mark of the best two should be taken. To ensure transparency of the evaluation process, the internal assessment marks awarded to the students in each course in a semester shall be notified on the notice board at least one week before the commencement of external examination. There shall not be any chance for improvement for internal marks. The course teacher(s) shall maintain the academic record of each student registered for the course, which shall be forwarded to the Controller of examination, Vimala College, Thrissur, after obtaining the signature of both course teacher and Head of the Department.

The Split up of marks for Test paper and Class Room Participation (CRP) for internal evaluation are as follows.

Split up of marks for test papers

Range of Marks in test paper	Out of 8 (Maximum internal marks is 20)	Out of 6 (Maximum internal marks is 15)
Less than 35%	1	1
35%-45%	2	2

45% - 55%	3	3
55% - 65%	4	4
65% -85%	6	5
85% -100%	8	6

Split up of marks for Classroom Participation (CRP)

Range of CRP	Out of 4 (Maximum internal Marks is 20)	Out of 3 (Maximum internal Marks is 15)
50% \leq CRP <75%	1	1
75% \leq CRP <85%	2	2
85 % and above	4	3

External Evaluation

- a) External evaluation carries 80% of marks.
- b) All question papers shall be set by the college.
- c) The external question papers may be of uniform pattern with 80/60 marks (The pattern is given in the Annexure).
- d) The general components taken from other UG Programmes with 3 credits will have an external examination of 2 hours duration with 60 marks and courses with 4credits will have an external examination of 2.5 hours duration with 80 marks.
- e) The external examination in theory courses is to be conducted by the college. The evaluation of the answer scripts shall be done by examiners based on a well-defined scheme of valuation and answer keys shall be provided by the Controller of Examination, Vimala College, Thrissur.
- f) The external examination in practical courses shall be conducted by two examiners – one internal and an external, the latter appointed by the Controller of Examination, Vimala College, Thrissur. No single Examiner is given the charge of conducting the examination. Both the internal and external examiners are equally responsible for the examination work; however evaluation and viva-voce shall be done by the external examiner. The practical board meeting should be conducted before conducting the external practical examination with the concerned examiners. The instructions for conducting the practical examinations, the mark distribution, question paper distribution and related matters should be discussed in the practical examination board meeting. The scheme of valuation must be strictly followed so as to ensure uniformity.
- g) After the external evaluation only marks are to be entered in the answer scripts. All other calculations including grading are done by the examination section of the college.

Internship and Project

- a) Internship or the mini/main project should be carried out in the industry, not necessarily with industry partner. The major idea for internship is to implement the things learned and to get a real life experience.
- b) The Evaluation process follows 20% internal assessment & 80% external assessment.
- c) There will be internship/project at the end of 2nd and 4th semesters.
- d) The sixth semester includes one internship and project for the whole semester along with a term paper. Every student shall undergo one internship for the whole semester and along with that they should do a project based on their internship. At the end of the semester they should submit internship report and project.
- e) Every student will be assigned an internal guide, allotted from the parent department concerned or an expert available in the college appointed by the principal or the head of the department. The student has to make regular discussions with the guide while choosing the subject/area and throughout the life time of the project.
- f) At least three reviews should be conducted to evaluate the progress of work.
- g) Since Internship and Project is considered as a single course having a common course code and course name, external examination is also conducted as single. But the evaluation (internal as well as external) should be done separately for internship and project. In the mark sheet and Grade Card, the split up mark is to be shown.
- h) An evaluation team is constituted for conducting the evaluation. The team consists of external examiner and a faculty from the institution. If necessary, representatives from the industry can also be added to the panel.
- i) Students should submit a report of their work. A valid certificate of internship from the organization should be produced as a proof that the work is carried out in the respective organization. Attendance statement also should be produced.
- j) Students are required to make the presentations of their work to present before the panel of examiners. A viva will be conducted based on the report and students are supposed to clarify the queries regarding their work.

Mark distribution for internship

Distribution	External	Internal
Report	100	30
Viva	60	10
Total	160	40

Mark distribution for Project

Marks Distribution	Total marks	Internal Assessment Marks
Theory/ Algorithm/Flow diagram	40	5
Implementation	80	20
Result/Output	20	5
Record	10	5
Viva	10	5
Total	160	40

Evaluation of Audit courses

The examination shall be conducted by the college. The Question paper shall be of 100 marks of 3 hour duration. For SDE/Private students it may be of MCQ/ fill in the blank type questions or online question paper may be introduced.

Evaluation of Term Paper

The term paper shall be in the sixth semester along with internship and project. It should be in the standard format which is eligible for publishing. It has no external evaluation but only internal assessment. The concerned Board of Studies shall include necessary guidelines for the evaluation of term paper.

Minimum for pass

The successful completion of all the courses prescribed for the diploma/degree programme with P grade shall be the minimum requirement for the award of diploma/degree.

Notes:

1. For Project/internship, the minimum for a pass shall be 50% of the total marks assigned to the respective examination. A student who does not secure this pass marks in a subject will have to repeat the respective subject.
2. If a candidate has passed all examinations of B.Voc Programme (at the time of publication of results of last semester) except Internship and Project in the last semester, a re-examination for the same should be conducted within one month after the publication of results. Each candidate should apply for this Save-A-Year examination within one week after the publication of last semester results.

Pattern of Questions for Semester-End Examinations of Theory/Practical Subjects

The question papers of Semester-End examinations of theory subjects shall be able to perform achievement testing of the students in an effective manner. The question paper shall be prepared

- Covering all sections of the course syllabus and total marks from each module should be approximately the same.
- Unambiguous and free from any defects/errors
- Emphasizing knowledge testing, problem solving & quantitative methods
- Containing adequate data/other information on the problems assigned
- Having clear and complete instructions to the candidates.

The external question papers may be of uniform pattern with 80/60 marks. Duration of Semester-End examinations with 3 credits will have an external examination of 2 hours duration with 60 marks and courses with 4credits will have an external examination of 2.5 hours duration with 80 marks.

The pattern of questions for theory subjects with credit 4 shall be as follows:

Section	Total No of Questions	No. of Questions to be answered	Marks for each question	Total marks	Ceiling
A: Very Short/ Objective answer questions	15	15	2	30	25
B: Short answer questions	8	8	5	40	35
C: Essays	4	2	10	20	20
Total					80

The pattern of questions for theory subjects with credit 3 shall be as follows:

Section	Total No of Questions	No. of Questions to be answered	Marks for each question	Total marks	Ceiling
A: Very Short/ Objective answer questions	12	12	2	24	20
B: Short answer questions	7	7	5	35	30
C: Essays	2	1	10	10	10
Total					60

For practical:

Marks Distribution	Total marks
Theory/ Algorithm/Flow diagram	20
Implementation	30
Result/Output	10
Record	10

Viva	10
Total	80

Credit System

Each subject shall have a certain number of credits assigned to it depending upon the academic load and the nature and importance of the subject. The credit associated with each subject will be shown in the prescribed scheme and syllabi. Each course shall have an integer number of credits, which reflects its weightage.

Grading- Indirect Grading System

Indirect Grading System based on a 10-point scale is used to evaluate the performance of students.

- Each course is evaluated by assigning marks with a letter grade (O, A+, A, B+, B, C, D, E or F) to that course by the method of indirect grading.
- An aggregate of P grade (after external and internal put together) is required in each course for a pass (Except for project*) and also for awarding a degree/diploma (A minimum of 20% marks in external evaluation is needed for a pass in a course. But no separate pass minimum is needed for internal evaluation).
- Appearance for Internal Assessment and End Semester Evaluation are compulsory and no grade shall be awarded to a candidate if she is absent for Internal Assessment / End Semester Evaluation or both.
- A student who fails to secure a minimum grade for a pass in a course is permitted to write the examination along with the next batch.
- After the successful completion of a semester, Semester Grade Point Average (SGPA) of a student in that semester is calculated using the formula given below. For the successful completion of a semester, a student should pass all courses. However, a student is permitted to move to the next semester irrespective of SGPA obtained.
- SGPA of the student in that semester is calculated using the formula

$$\text{SGPA} = \frac{\text{Sum of the credit points of all courses in a semester}}{\text{Total credits in that semester}}$$

- The Cumulative Grade Point Average (CGPA) of the student is calculated at the end of a programme. The CGPA of a student determines the overall academic level of the student in a programme and is the criterion for ranking the students. CGPA can be calculated by the following

$$\text{CGPA} = \frac{\text{Total credit points obtained in six semesters}}{\text{Total credits acquired (180)}}$$

- SGPA and CGPA shall be rounded off to two decimal places. CGPA determines the broad academic level of the student in a programme and is the index for ranking students (in terms of grade points).

- An overall letter grade (Cumulative Grade) for the entire programme shall be awarded to a student depending on her/his CGPA

Indirect Grading System in 10 -point scale is as below:

Percentage of Marks (Both Internal & External put together)	Grade	Interpretation	Grade point Average (G)	Range of grade points	Class
95 and above	O	Outstanding	10	9.5 -10	First Class with Distinction
85 to below 95	A+	Excellent	9	8.5 -9.49	
75 to below 85	A	Very good	8	7.5 -8.49	
65 to below 75	B+	Good	7	6.5 -7.49	First Class
55 to below 65	B	Satisfactory	6	5.5 -6.49	
45 to below 55	C	Average	5	4.5 -5.49	Second Class
35 to below 45	P	Pass	4	3.5 -4.49	Third Class
Below 35	F	Failure	0	0	Fail
Incomplete	I	Incomplete	0	0	Fail
Absent	Ab	Absent	0	0	Fail

7. GRADE CARDS

The College shall issue to the students grade/marks card (by online) on completion of each semester, which shall contain the following information.

- Name of University
- Name of College
- Title of B.Voc Programme

- Semester concerned
- Name and Register Number of students
- Code number, Title and Credits of each course opted in the semester
- Internal marks, External marks, total marks, Grade point (G) and letter grade for each course in the semester
- The total credits, total credit points and SGPA in the semester (corrected to three decimal places)
- Percentage of total marks

The final Grade/mark Card issued at the end of the final semester shall contain the details of all courses taken during the entire Programme including those taken over and above the prescribed minimum credits for obtaining the degree. The final grade card shall show the percentage of marks, CGPA (corrected to two decimal places) and the overall letter grade of a student for the entire Programme. The final grade/mark card shall also include the grade points and letter grade of general and skill components. This is to be done in a ten point indirect scale. The final Grade Card also contains the list of Audit Courses passed and the details of Extra Credits.

8. REVALUATION

In the new system of grading, revaluation is permissible. The prevailing rules of revaluation are applicable to CBCSS VUG 2021. Students can apply for photocopies of answer scripts of external examinations. Applications for photocopies/scrutiny/revaluation should be submitted within 10 days of publication of results. The fee for this shall be as decided by the college.

9. COURSE IMPROVEMENT

A maximum of two courses can be improved in each semester. Improvement of a particular semester can be done only once. The student shall avail the improvement chance in the succeeding year after the successful completion of the semester concerned. The internal marks already obtained will be carried forward to determine the grades/marks in the improvement examination. If the candidate fails to appear for the improvement examination after registration, or if there is no change in the results of the improvement examination appeared, the marks/grades obtained in the first appearance will be retained.

Improvement and supplementary examinations cannot be done simultaneously.

10. AWARD OF DEGREE

The successful completion of all the courses (General Education Components, Skill development Components and Audit courses) prescribed for the B.Voc. Food Processing Programme with P grade shall be the minimum requirement for the award of B.Voc. Food Processing degree.

Levels of Awards

B.Voc. is programme with multiple exits. Following table shows the various certificates and their duration.

Awards	Duration
Diploma	2 Semesters
Advanced Diploma	4 Semesters
B.Voc. Degree	6 Semesters

Students are free to exit at any point in the duration of the programme. Only those students who successfully complete the courses and clear the examination are eligible for the certificate. Separate certificate will be awarded for each year for successful candidates. Students who fail in any course may be allowed to move the higher level but won't be eligible for any certificates until she clears previous courses. B.Voc degree will confer to those whose successfully complete the diploma, advanced diploma and project/ internship.

11. GRIEVANCE REDRESSAL COMMITTEE

COLLEGE LEVEL

There shall be a College Level Grievance Redressal Committee comprising of Student Advisor, two senior teachers and two staff council members (one shall be elected member) as members and principal as Chairman. The College shall form a Grievance Redressal Committee in each department comprising of course teacher, one senior teacher and elected representative of students (Association Secretary) as members and the Head of the department as Chairman. This committee shall address all grievances relating to the internal assessment grades of the students

12. ANTI RAGGING CELL

Head of Institution shall take necessary steps to constitute anti-ragging committee and squad at the commencement of each academic year. The committee and the squad shall take effective steps as specified by the Honorable Supreme Court of India, to prevent ragging.

13. PROGRAM SPECIFIC OUTCOMES

- Develop competency in Baking and Confectionery products.
- Gain knowledge in Dairy Processing
- Understand Food Quality Control
- Analyse Microbiological aspects in Food
- Gain an insight on Food Production and Packaging
- Develop competency in Entrepreneurship Management.

14. PROGRAM STRUCTURE

LEGEND	
Item	Description
C	Credits
E	External Component (%)
I	Internal Component (%)
L	Lecture Hours
P	Practical Hours
T	Total

NSQF levels and Job Roles

NSQF Level	Skill Component Credits	General Education Credits	Total Credits	Duration	Exit Awards	Job Role/Reference ID
4	18	12	30	One Sem	Certificate	Baking Technician (FIC/Q5005) Mixing Technician (FIC/Q5004)

5	36	24	60	Two Sem	Diploma	Plant Baker (FIC/Q5001) Dairy Food Processor (FIC/Q2001) Dairy Product Processor Supervisor (FIC/Q2007) Processed Food Entrepreneurs (FIC/Q9001) Food Product Packing Technician (FIC/Q7007)
6	72	48	120	Four Sem	Advanced Diploma	Food Microbiologist (FIC/Q7603) Quality Assurance Manager (FIC/Q7602) Food Regulatory Affair Manger (FIC/Q9002)
7	108	72	180	Six sem	B.Voc Degree in Food Processing	Production Manager (FIC/Q9003) Food Quality Controller (Not Aligned) Entrepreneurs (Not Aligned)

General Program Structure

SEMESTER I									
C.No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
1.1	A01	English	3	15	60	75	3		3
1.2	A02	English	3	15	60	75	3		3
1.3	A07(3)	Mal/Hindi	4	20	80	100	4		4
1.4	SDC1FP01	Perspectives Of Food Science	4	20	80	100	4		4
1.5	SDC1FP02	Food Quality and Food Safety Management	4	20	80	100	4		4
1.6	SDC1FP03	Baking And Confectioneries	4	20	80	100			4
1.7	SDC1FP04(P)	Baking And Confectioneries (Practical)	4	20	80	100		4	4
1.8	SDC1FP05(P)	Food Science (P)	4	20	80	100		4	4
1.9		Audit Course 1	4						
Semester Total			30			750	22	8	30
SEMESTER II									
C.No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
2.1	A03	English	4	20	80	100	4		4
2.2	A04	English	4	20	80	100	4		4
2.3	A08(3)	Mal/Hindi	4	20	80	100	4		4
2.4	SDC2FP06	Post-Harvest Technology	3	15	60	75	3		3
2.5	SDC2FP07	Food Additives And Adulteration	4	20	80	100	4		4
2.6	SDC2FP08	Dairy Products And Processing	3	15	60	75	3		3
2.7	SDC2FP09(P)	Dairy Products And Processing (Practical)	4	20	80	100		4	4

2.8	SDC2FP10(P)	Internship	4	20	80	100		4	4
2.9		Audit Course II	4						
Semester II Total			30			750	22	8	30

SEMESTER III

C.No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
3.1	A11	Basic Mathematics and General Awareness	4	20	80	100	4		4
3.2	A12	Professional Business Skills	4	20	80	100	4		4
3.3	GEC3PN01	Principles Of Nutrition	4	20	80	100	4		4
3.4	SDC3FP11	Food Preservation	4	20	80	100	4		4
3.5	SDC3FP12	Fruits And Vegetable Processing Technology	4	20	80	100	4		4
3.6	SDC3FP13(P)	Fruits And Vegetable Processing Technology(Practical)	5	20	80	100		5	5
3.7	SDC3FP14(P)	Food Preservation And Beverages (Practical)	5	20	80	100		5	5
		Audit Course III	4						
Semester III Total			30			750	20	10	30

SEMESTER IV

C.No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
4.1	A13	Entrepreneurship Development	4	20	80	100	4		4
4.2	A14	Public Health Sanitation and Safety	4	20	80	100	4		4
4.3	GEC4RM02	Research Methodology	3	15	60	75	3		3
4.4	SDC4FP15	Byproduct Utilization and Waste Management	3	15	60	75	3		3

4.5	SDC4FP16	Food Packaging And Labelling	4	20	80	100	4		4
4.6	SDC4FP17	Food Microbiology	4	20	80	100	4		4
4.7	SDC4FP18(P)	Food Microbiology (Practical)	4	20	80	100		4	4
4.8	SDC4FP19(P)	Internship(Project Report)	4	20	80	100		4	4
		Audit Course IV	4						
Semester IV Total			30			750	22	8	30
SEMESTER V									
C.No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
5.1	SDC5FP20	Business Management	4	20	80	100	4		4
5.2	SDC5FP21	Food Engineering	4	20	80	100	4		4
5.3	SDC5FP22	Food Chemistry	4	20	80	100	4		4
5.4	SDC5FP23	Food Plant Designing And Layout	4	20	80	100	4		4
5.5	SDC5FP24	Animal Food Processing	4	20	80	100	4		4
5.6	SDC5FP25(P)	Animal Food Processing (Practical)	5	20	80	100		5	5
5.7	SDC5FP26(P)	Quantity Food Preparation (Practical)	5	20	80	100		5	5
Semester V Total			30			750	20	10	30
SEMESTER VI									
C.No	Course Code	Course Name	Credit	Marks			Hrs		
				Int	Ext	Tot	T	P	Tot
6.1	SDC6FP27(P)	Term paper	2	50	--	50			
6.2	SDC6FP28(Pr)	Internship & Project (900hrs.)	28					900	
		Internship		40	160	200			900
		Project		40	160	200			
Semester VI Total			30	130	320	450			900

Grand Total	180			4200			
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Semester I

Perspectives of Food Science

Course Code: SDC1FP01

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- Understand the nutritive composition of different food groups.
- Impart knowledge about the different methods of cooking

Course outcomes:

- Understand the Composition and nutritive value of different food groups
- Understand different health foods- its importance and functions.
- Understand and evaluate the organoleptic qualities of different food items.

Course Outline

UNIT I: Composition and nutritive value of plant foods (30 hrs)

1. Introduction: - Introduction to food science. Nutrients and functions of food
Different methods of cooking
2. Cereals: General outline, Composition & Nutritive value, Structure of wheat and Rice
Cereals and Millets: Wheat- structure and composition, types (hard, soft/ strong, weak). Process of malting, gelatinization of starch, types of browning. Rice- Composition of rice obtained by different de-husking methods, parboiling of rice- advantages and disadvantages. Millets -Varieties, composition and uses of maize, sorghum, barley, rye, oats, triticale, pearl millet and finger millet.
3. Pulses & Legumes: Composition, Nutritive value, Anti nutritional factors Changes during cooking, Factors affecting cooking time, Germination, Changes during germination.

4. Nuts & Oilseeds: Composition, sources of proteins and oil, Processing of oil seeds - Soya bean, coconut, Protein isolates, Texturized vegetable protein.
5. Fruits & Vegetables: Composition, Classification, Nutritive value, Vegetable Cookery, Changes during cooking, Ripening, Climacteric, Non-climacteric fruits, Changes during ripening.
6. Sugar, Fat and Fatty acid Classification

UNIT II : Composition and Nutritive Value of Animal Foods(20 hrs)

1. Eggs: Structure, Composition, Nutritive value, Grading Changes during storage.
2. Fish: Composition, Nutritive value
3. Meat: Structure, Composition, Nutritive value

UNIT III: Health Foods(4hrs)

1. Health foods: Functional foods, Prebiotics, Probiotics, Nutraceuticals, Organic foods, GM foods, Novel foods
2. Spices: Definition, Classification, Chemical composition, use of spices
3. Plantation Crops

UNIT IV: Evaluation of Food(6 hrs)

1. Objective and Subjective evaluation

References:

2. N Shakuntalamanay and M Shadakshara Swamy (2001) Food Facts and Principles, 2nd Edition, New Age International Publishers.
3. Srilakshmi, B. (2015) Food Science, 6th edition, New Age International Publishers.
4. M Swaminathan (1999) Food science, Chemistry & Experimental Foods, 2nd Edition, The Bangalore Printing & Publishing Co. LTD.

Food Quality and Food Safety Management

Course Code: SDC1FP02

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal 20 Marks + External – 80 Marks

Objectives:

- To learn about physical and chemical contaminants in foods.
- Study about food safety management and food laws

Course outcomes

- Understand the sanitary and Hygiene Practices in Food Industry
- Understand the location, layout and constructional details of an industry
- Develop knowledge regarding various food laws and standards

Course Outline

UNIT I: Sanitation and Health (15 Hours)

1. Definition, importance of sanitation, application of sanitation to food industry and food service establishments.
2. Purchasing and receiving safe food, food storage, sanitary procedures in food preparation, serving and displaying of food, special food operations.
3. Environmental Sanitation
4. Location and layout of premises, constructional details, sanitary requirements for equipments, guidelines for cleaning equipments, cleaning procedures, pest control, water supply, storage and waste disposal, environmental pollution.

UNIT II: Hygiene Practices in Food Industry (15 Hours)

1. Introduction, necessity, personnel hygiene, sanitary practices, management and sanitation- safety at work place.
2. Sanitation regulations and Standards- Introduction, regulatory agencies, control of food quality, local health authority. Food sanitation check lists.

UNIT III: Concept of Quality (20 Hours)

1. Quality attributes- physical, chemical, nutritional, microbial, and sensory
2. Concepts of quality management - Objectives, importance and functions of quality control, Quality assurance, Total Quality Management, Quality management systems in India, GMP/GHP, GLP, GAP
3. Quality manuals, documentation and audits, Export import policy, export documentation, Laboratory quality procedures and assessment of laboratory performance

4. Sampling procedures and plans, Global Food safety Initiative, Labeling issues
5. International food standards- Codex Alimentarius, ISO and Hazard Analysis Critical Control Point: Definition, principles, product standards and product control – HACCP, Guidelines for the application of HACCP system.

UNIT IV: Food Laws and Standards (10 Hours)

1. Introduction and need of food laws.
2. Mandatory food laws; The food safety and standards Act 2006,
3. Indian food regulations –FSSAI 2006 – export and import laws and regulations – International food laws- CAC – WTO implications - national and international agencies for implementation
4. Recommended international code of hygiene for various products.

Reference:

1. Nollet and Toldra (2015), Hand Book of Food Analysis, 3rd Edition, CRC publishing Ltd.
2. Rangana S (2007), Hand Book of Analysis & Quality Control for Fruit & Vegetable Products, 2nd edition, Tata Mcgraw hill publishing.
3. Nielson S (2002), Introduction to the chemical analysis of foods, 2nd edition, CBS publishing.

Baking and Confectionaries

Course Code: SDC1FP03

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To impart basic and applied technology of baking and confectionary and acquaint with the manufacturing technology of bakery and confectionary products.
- To have a basic idea about baking and confectionery manufacture and quality control.
- To know about the importance of each ingredient in the bakery and how it effects the overall product and its sensory and quality parameters.

- To be able to start a small scale bakery and confectionery unit

Course outcomes

- Understand the basics of baking and various baking equipments
- Understand the importance of each ingredients in the baking and how it effects the overall product and its sensory and quality parameters
- Develop knowledge regarding setting up of a baking unit

Course Outline

UNIT I: Introduction to Baking (5 Hours)

1. Introduction & scope of Bakery & Confectionery, Bakery terms. Organization chart of Bakery.
2. Wheat processing. Flours: Different types of flours available, constituents of flours, PH Value of flour, water absorption power of flour, gluten, diastatic capacity of flour, grade of flour.

UNIT II: Fundamental Dough Rheology (15 Hours)

1. Rheology: Concepts & Fundamentals, Dough Formation, Microstructure & Role of Main Ingredients, Rheology of Bread Dough, Cake Batter, Rheology in Pasta Manufacturing.
2. Basic Principles of Texture Measurement, Phase Transitions of Starch & Gluten Polymers- , gelatinization, Retro gradation, Dextrinisation of starch.

UNIT III: Bread Making (20 Hours)

1. Raw material required for bread making, role of flour, water, yeast, salt-sugar, milk and fats. Methods of bread making: straight dough method, delayed salt method, no time dough method, sponge and dough method. Baking temperatures for bread.
2. Characteristics of good bread: External characteristics - volume, symmetry of shape; Internal characteristics - colour, texture, aroma, clarity and elasticity. Bread improvers- improving physical quality. Yeast – An elementary knowledge of Baker's yeast, the part it plays in the fermentation of dough and conditions influencing it's working.
3. Effect of over and under fermentation and under proofing of dough and other fermented goods. Bread faults and their remedies, Preservatives used in bread. Bread diseases – Rope and mold-causes and prevention.

UNIT IV: Oven & Baking (15 Hours)

1. Knowledge and working of various types of oven. Baking temperatures for

confectionery goods. Processing of cakes and biscuits- ingredients, development of batter, baking and packing, Spoilage in cakes and biscuits.

2. Pastry making, principles and various derivatives. Sugar boiled confectionery- crystalline and amorphous confectionery, rock candy, hard candy, lemon drop, china balls, soft candy, lollypop, marshmallows, fudge, cream, caramel, toffee, lozenges, gumdrops, honeycomb candy.
3. Various types of icing – Royal, butter- soft, hard, ganache & fondant. Storage of confectionery products.

UNIT V: Bakery Layout (5 Hours)

1. The required approvals for setting up bakery – Government procedure and Bye-laws.
2. Selection of site, equipment, layout design, electricity, sources of water, quality control of raw materials and quality control of finished products and waste management.

References:

1. Zhou W, Hui YH (2014). Bakery Products Science and Technology, 2nd Edition, Wiley Blackwell Publishers.
2. Pylar E J and Gorton L A (2009). Baking Science & Technology, 4th Edition, Sosland Publications.
3. Stanley P, Cauvain, Linda S Young (2008). Baked Products: Science Technology and Practice, 1st Edition, John Wiley & Sons Publishers.

Baking and Confectionaries (Practical)

Course Code: SDC1FP04(P)

Contact Hours per Week:4

Number of Credits: 4

Number of Contact Hours:60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To develop professional and practical knowledge in bakery and confectionary and make them competent as an entrepreneur.
- To improve the culinary skills of the students
- It helps the students to gain not only theoretical but also practical knowledge

Course outcomes

- Develop professional and practical knowledge in bakery and confectionary

Course outline

BAKERY:

1. Preparation of Bread rolls and Buns.
2. Cakes by different methods (e.g., sponge cake, fatless sponge, marble cake, birthday cake)

CONFECTIONERY

1. Biscuits & Cookies : Plain biscuits; piping biscuits; salted biscuits; nut biscuits; coconut biscuits; macaroons; chocolate biscuits; marble biscuits
2. Flaky/Puff pastry- veg patties; chicken patties; Choux pastry, Chocolate eclair; Short crust pastry: Lemon curd tart; jam tart.
3. Icing: Fondant; American frosting; Butter cream icing; Royal icing; marshmallow; lemon meringue; fudge; glace icing.
4. Toffees : Milk toffee; chocolate
5. Pastry: Pineapple pastry, chocolate pastry.
6. Cakes & Gateaux; easter eggs; chocolate dippings; Dough nuts; Pudding: cold lemon soufflé; chocolate mousse; fruit trifle.
7. Indian Sweets: Rasgulla, Rasmalai, Khoa - Gulab Jamun, Mysore Pak. Flour/Besan - Halwa, Laddo. Milk - Kheer, Rabri, Pedas; Nuts - Barfi, Chikki

Food Science (Practical)

Course Code: SDC1FP05(P)

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To determine different chemical consequences

Course outcomes

- Detect adulterants in different foods

- Estimate various nutrients present in foods
- Develop culinary skills in students

Course Outline

1. Determination of Moisture
2. Determination of Ash
3. Determination of Acidity & pH
4. Determination of T S S
5. Qualitative test for Carbohydrates – Molisch’s test, Benedict’s test, Iodine test, Selivanoff’s test, Phenyl hydrazine test.
6. Qualitative test for Protein – Ninhydrine reaction, Xanthoproteic test, Biuret test
7. Estimation of Gluten - Determination of Water absorption power, Dough raising. Qualitative analysis of gluten – Belshanke value. Sedimentation value of flour, Determination of amylase activity- falling number method
8. Detection of adulterants in foods such as a) milk, honey b) Estimation of SO₂ in fruit products c) Estimation of purity of potassium metabisulphite d) Qualitative determination of benzoic acid.
9. Preparation of any two recipes with different food groups and sensory evaluation
10. Standardisation of any one novel recipe by each student

References

1. Kurt A R and Evers AD (2018), Kents Technology of Cereals, 5th Edition, Wood Head Publishing.
2. Dendy DAV and Bogdan J D (2001), Cereals and Cereal Products: Chemistry and Technology Aspen Publication.
3. Samuel A M (2013), Chemistry and Technology of Cereal Food and Feed, 2nd Edition, AVI book publishers

Semester II

Post-Harvest Technology

Course Code: SDC2FP06

Contact Hours per Week: 3

Number of Credits: 3

Number of Contact Hours: 45

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives:

- To improve food security by safeguarding the produce's safety
- To minimise post-harvest losses

Course outcomes

- Understanding of various post-harvest operations
- Understanding about storage of agricultural produce.
- Ability to determine the maturity and grade of produce.

Course outline

Unit I: Introduction of post-harvest technology (10 Hours)

1. Introduction to post harvest technology -Production, Losses, Need, Scope and importance.
2. Introduction to various post-harvest operations such as Harvesting, Handling cleaning, grading, sorting, drying, storage, milling, size reduction, expelling, extraction, blending, heat treatment, separation, material handling (transportation, conveying, elevating), washing; their functions and use in the post- harvest processing.

Unit II: Post Harvest Management of Cereals and Pulses (10 Hours)

1. Principles. Types –Drying, Milling, and Storage -Storage principles, Temperature and moisture changes during storage i.e. influence of moisture content, relative humidity, temperature, fungi etc. on stored product.
2. Common Insect Infections in stored grains and pulses. Traditional and Modern storage methods of cereals & Pulses

Unit III: Post Harvest Management of fruit & Vegetables (10 Hours)

1. Maturity, ripening and biochemical changes after harvesting; Climacteric and Non Climacteric fruits.
2. Post-harvest loss reduction technologies
3. Post-harvest treatments of fruit and vegetable- Pre-cooling, Evaporative cooling, MAP & CA storage and Packing

Unit IV: Post Harvest Management of oilseeds (10 Hours)

1. Post-Harvest handling, grading, Pre-treatments-cleaning, De-hulling, Flaking and heat treatment.
2. Extraction of oil, Refining and Packaging.

Unit V: Post Harvest Management of Milk (5 Hours)

1. Procurement of milk from farm. Pre-treatment- chilling, filtration & heat treatment. Storage, packaging, Transportation.

Reference:

1. A.Chakraverty (2019) Post Harvest Technology of Cereal, Pulses, Oil seeds Oxford & IBH Publication Co.
2. Thompson , Post-Harvest Technology of fruits & Vegetables, CBS Publishers and Distributors
3. Wills R.B.H. (1981) Post Harvest (Introduction Physiology Handling fruits & Vegetables) Oxford & IBH Publication
4. Sukumar De (1980) Outlines of dairy technology, Oxford publishers

Food Additives and Adulteration

Course Code: SDC2FP07

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To understand the importance of food additives in food processing technology also to study the merits and demerits of addition of food additives.

Course outcomes

- Understand types and role of different food additives.
- Develop knowledge regarding the safety levels of different food additives.
- Determine adulteration in food.
- To understand the importance of food additives in food processing technology also to study the merits and demerits of addition of food additives.

Course Outline

UNIT I: Introduction to Food Additives (20 Hours)

1. Definition. Role of Food Additives in Food Processing, functions -Classification - Intentional & Unintentional Food Additives. Safety Evaluation of Food Additives, Beneficial and Toxic Effects. Food Additives - Generally Recognized As Safe (GRAS), Tolerance levels & Toxic levels in Foods.
2. Types of food additives- Preservatives, antioxidants, colours and flavours (synthetic and natural), sequesterants, humectants, hydrocolloids, sweeteners, acidulants, buffering salts, anticaking agents – uses and functions in formulations; indirect food additives.

UNIT II: Derived Food additives (10 Hours)

1. Proteins, starches and lipids as functional ingredient; isolation, modification, specifications, functional properties and applications in foods and as nutraceuticals.
2. Manufacturing and applications of fibres from food sources, fructo-oligosaccharides.

UNIT III: Food Additives as toxicants (15 Hours)

1. Artificial colours, preservatives, sweeteners; toxicants formed during food processing such as nitrosamines, maillard reaction products acrylamide, benzene, heterocyclic amines and aromatic hydrocarbons;
2. Risk of genetically modified food, food supplements, persistent organic pollutants, toxicity implications of nanotechnology in food.

UNIT IV: Flavour Technology (5 Hours)

1. Types of flavours, flavours generated during processing – reaction flavours, flavour composites, stability of flavours during food processing, analysis of flavours, extraction techniques of flavours, flavour emulsions; essential oils and oleoresins.

UNIT V: Food Adulteration (10 Hours)

1. Common Food adulterants and their tests: Milk, Vegetable oil, Spices, Tea, Pulses, Sugar, Honey

References:

1. Titus A M M (2013), The Chemistry of Food Additives and Preservatives, 1st Edition, Wiley-Blackwell Publishers.
2. Jim Smith and Lily Hong-Shum (2011), Food Additives Data Book, 2nd Edition, Wiley-Blackwell Publishers.
3. Deshpande S S (2002), Handbook of Food Toxicology, 1st Edition, Marcel Dekker Publishers.

Dairy Products and Processing

Course Code: SDC2FP08

Contact Hours per Week: 3

Number of Credits: 3

Number of Contact Hours: 45

Course Evaluation: Internal – 15 Marks + External – 60Marks

Objectives:

- To inculcate the knowledge regarding various dairy products and its processing techniques Efficiently
- To understand about the products that can be made from milk.
- To understand the processing and storage of dairy products.
- To know about the quality control measures applied in dairy industries.
- To have a basic idea about their processing and products which can be made at a small scale

Course outcomes

- Understand various dairy products and its processing techniques
- Understand the quality control measures applied in dairy industries

Course Outline

UNIT I: Introduction (5 Hours)

1. Milk - Definition, sources, and composition of milk, factors effecting composition of milk, physiochemical properties of milk, grading of milk-definition and types of grades, collection and transportation of milk

UNIT II: Processing of market milk (15 hours)

1. Flowchart of milk processing, Reception, Different types of cooling systems. Clarification and filtration process, standardization- Pearson's square method, pasteurization-LTLT, HTST and UHT process- continuous pasteuriser, Sterilisation and Homogenisation, Cream separation- centrifugal cream separator, bactofugation.

UNIT III: Special milk (5 Hours)

1. Skim milk, evaporated milk, condensed milk, standardized milk, toned milk, double toned

milk, flavoured milk, reconstituted milk.

UNIT IV: Indigenous and Fermented milk products (10 Hours)

1. Product description, methods for manufacture of butter, cheese, ice cream, khoa, channa, paneer, shrikhand, ghee. Spray drying system: dried milk- whole milk and skim milk powder. Instantization of milk.

UNIT V: In-Plant Cleaning system (10 Hours)

1. Introduction to Cleaning in- place (CIP) system - cleaning procedure, cleaning efficiency, Methods of cleaning in food industry, cleaning solutions – Detergents, Sanitizers. SIP system of dairy plant, Personal hygiene in dairy plant

References:

1. Joshi V K (2015), Indigenous Fermented Foods of South Asia, 1st edition, CRC Press.
2. Alan H. V and Jane P S (2013), Milk and Milk Products: Technology, chemistry and microbiology, Springer Science & Business Media Publishers.

Dairy Products and Processing (Practical)

Course Code: SDC2FP09(P)

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To develop the skills in dairy product preparation and to familiarise with the dairy plant equipments.
- To gain knowledge about preparation of some dairy products

Course outcomes

- Develop knowledge regarding various equipment used in dairy plant
- Develop skills in performing different quality tests practiced in Dairy Plants
- Develop skills in dairy product preparation.

Course Outline

1. Milk Testing - Platform Tests.
2. Determination of Acidity (Titrable Acidity) of Milk, butter and curd.
3. Determination of ash, total solids, fat and SNF content in milk.
4. Clot on boiling test for milk.
5. Determination of specific gravity of milk.
6. Detection of Addition of Starch in Milk.
7. Detection of salt content in butter - Mohr method
8. Estimation of moisture and free fatty acid contents in ghee
9. Preparation of Lassi.
10. Preparation of khoa.
11. Preparation of Basundi.
12. Preparation of chakka and shrikand.
13. Preparation of kalakand.
14. Preparation of cooking butter.
15. Preparation of ghee.
16. Preparation of flavoured milk.
17. Visit to milk product development centre.

Internship

Course Code: SDC2FP10(P)

Number of Credits: 4

Course outcome

Develop real world experience in food sectors

Semester III

Basic Mathematics and General Awareness

Course code: A11

Hours per week: 4,

Number of Credits 4

Number of contact hours: 60

Course evaluation: Internal: 20, External: 80,

Objectives:

- Understand and explain the importance of critical thinking.
- To overcome or solve the problems occurring in our everyday life.
- To understand basic of computer and relative concepts.
- To make the students understand the various services offered by various banks and insurance companies.

Course Outcomes:

- Apply numerical and reasoning skills in competitive examinations.
- Understand some basic concepts of research and its methodologies.
- Bridge the fundamental skills of computers with the present level of knowledge of the students.
- To train and equip the students with the skills of modern banking and insurance.

Course outline

UNIT I : Numerical Ability (12 Hours)

1. Data Interpretation (Bar Graph, Line Chart, Tabular, Pie Chart), Inequalities/ Quadratic Equations, Number Series, Simplification and Approximation, Percentages, Average, Ratio and Proportion, Partnership, Profit and Loss, Simple Interest & Compound Interest, Problem on Ages, Data Sufficiency, Speed, Distance and Time, Work, Time and Wages, Probability, Permutation and Combination.

UNIT II: Reasoning Ability (15 Hours)

1. Advance Puzzles, Seating Arrangements, Distance and Direction, Blood Relations, Syllogism, Order and Ranking, Coding-Decoding, Machine Input-Output, Alphabet and Number Series. Analogy, Passage and Conclusions, Statement and Conclusion, Statement and Assumptions, Statement and Arguments, Decision Making

UNIT III: Research Aptitude (12 Hours)

1. Research: Meaning, Types, and Characteristics, Positivism and Post positivism approach to research, Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods, Steps of Research, Thesis and Article writing: Format and styles of referencing, Application of ICT in research, Research ethics.

UNIT IV: Computer Aptitude (15 Hours)

1. History of computers, Basics of computer's hardware and software, Short Cut Keys, operating system, Internet, Networking, Basics of MS-Office: MS-word, MS-Excel, MS-

PowerPoint, Database, Hacking, Security Tools and Viruses.

UNIT V: General/ Financial Awareness (16 Hours)

1. History of Banking in India, Banking and Financial Reforms in India, Financial Institutions in India, Functions of Banks, Types of Bank Accounts, Types of Loans, Types of Mortgages, Types of Cheque & Cards, Foreign Banks in India, Fund Transfer Services, Structure of Banking Industry, Principles of Insurance, Credit & Debit, Mutual Funds, Bombay Stock Exchange (BSE), National Stock Exchange (NSE), Banking Ombudsman, Inflation, Money Laundering & Anti-Money Laundering, Green Banking, RBI Act, 1934.

References:

1. Quantitative Aptitude for Competitive Examinations - Quantitative Aptitude R.S Agrawal, S.Chand, ISBN: 9789352534029, 9789352534029 Edition: Revised & Enlarged Edition, 2020
2. Verbal Reasoning (Useful For Various Competitive Exams), Dr. LAL & KUMAR, ISBN: 978-81-7482-581-0
3. Teaching and Research aptitude, Upkar's Publications, Pratiyogitha Darpan, ISBN : 97874822154.
4. Banking Awareness (English, Paperback, unknown), Arihant Publishers, ISBN: 9789311124667, 9789311124667

Professional Business Skills

Course code: A12

Hours per week: 4,

Number of Credits: 4

Course evaluation: Internal: 20, External: 80

Objectives:

- To update and expand basic Informatics skills of the students
- To equip the students to effectively utilize the digital knowledge resources for their study

Course Outcomes:

- Able to become a professional by acquiring various soft skills needed for business success
- Explore the world of e-learning and also the various consequences of Cyber space and crimes.
- Application of data analysis and the role of artificial intelligence in e-business.

- Apply the skills of digital marketing and e-commerce

Course outline

UNIT I (15 Hours)

1. Professionalism: Meaning -Definition – Characteristics - Traits and Qualities of a good professional - Professionalism in business - Professional Skills: important soft skills for business success- Professionalism in Communication: Verbal Communication: Professional Presentation - Different Presentation Postures- Written Communication: Email – Significance of Email in business – Email etiquette: format - rules – dos and don'ts – Technical Documentation: Standards – Types

UNIT II (12 Hours)

1. E-Learning : Introduction of electronic learning - benefits and drawbacks of e-Learning - Online education - Digital age learners - Knowledge resources on internet - E-books, Audio,
2. Video and other means for e-learning- Introduction to e-content development and tools - Online libraries – MOOCs - The e-Learning as a service Industry - major technologies used in e-learning- different approaches for e-Learning delivery - E-learning in India

UNIT III (18 Hours)

1. Business Data Analysis : Features of New Generation Computers – Concept of data analysis – Business Data Analysis – Data Analyst – Types of analysts - organisation and source of data, importance of data quality, dealing with missing or incomplete data- Social Networking Analysis – Big Data Analysis - Role of Data Scientist in Business & Society - Role of Artificial Intelligence and Intelligent Agents in e-business - Ethical and Legal considerations in Business Analytics

UNIT IV (15 Hours)

1. Socio - Cyber Informatics: IT and society - Digital Divide – Digital Natives-Cyber Space New opportunities and threats - Cyber ethics - Cyber-crimes -Types - Cyber Laws – Organisations related with cyber laws-Cyber addictions - Information overload – Health issues - e-waste and Green Computing –Recent E-governance initiatives in India

UNIT V (20 Hours)

1. Digital Marketing : Introduction to Digital marketing Environment –meaning & Concept –Need for digital marketing – Advantages and disadvantages of digital marketing -Trends in digital marketing- Types of digital marketing – Business models in digital marketing Business to Business (B2B), Business to Customer (B2C), Customer to Customer (C2C), Business to Employees (B2E), Business to Government (B2G) - Online advertising - types of online advertising - Top e-commerce websites around the world and its scenario

in India. PPC (Pay per Click) advertising – Search engine Analytics – search engine ads – social media channels and ads

References:

1. Professional Business Skills – Lee Pelitz 2nd Edition
2. Peter Norton, Introduction to Computers, Tata McGraw Hill Private Limited, New Delhi,
3. Alan Evans, ITL ESL, Leslie Lamport, Dolores Etter, Darren George, Kenneth C Laoudon, Gary Rogers, Rainer Handel, INFORMATICS -Technology in Action, Pearson Education, Delhi, 2009.
4. V.Rajaraman, Introduction To Information Technology, PHI Learning Private Limited, New Delhi, 2009.
5. Godfrey Parkin, Digital Marketing: Strategies for online success, New Holland publishers Ltd,2009
6. Damian Ryan, Understanding Digital marketing: Marketing strategies for Engaging the Digital generation, Kogan page,3rd Edition,2014
7. Jonah Berger, Contagious Why things catch on, Simon&Schuster,2013
8. Turban E, Armson, JE, Liang, TP &Sharda, Decision support and Business Intelligence Systems, 8thEdition, John Wiley & Sons, 2007
9. Frank J. Ohlhorst, Big Data Analytics, 1st Edition, Wiley, 2012.
10. Efraim Turban, Ramesh Sharda, Jay Aronson, David King, Decision Support and Business Intelligence Systems, 9th Edition, Pearson Education, 2009
11. Microsoft Office 2007 Business Intelligence - Reporting, Analysis, and Measurement from the Desktop, Doug Harts, TATA McGraw-Hill Edition, 2008
12. Data Mining for Business Intelligence: Concepts, Techniques, and Applications in Microsoft Office Excel with XL Miner, Galit Shmueli, Nitin R. Patel, Peter C. Bruce, Wiley Publication, 2010

Principles of Nutrition

Course Code: GEC3PN01

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To get knowledge regarding important nutrients needed for our body
- Gain knowledge regarding functions and sources of these nutrients

Course outcomes

- Understand the concept of Nutrition and Balanced diet
- Develop knowledge regarding important nutrients needed for our body
- Develop knowledge regarding functions and sources of these nutrients

Course Outline

UNIT I: Concept of Nutrition (10 Hours)

1. Definition of terms - Nutrition, under nutrition, malnutrition, symptoms and remedy, Health and nutritional status-adequate optimum and good nutrition
2. Energy – Definition of calorie and Joule, Energy value of foods, Basal Metabolic Rate (BMR), factors affecting BMR.
3. Food Guide - Nutrients supplied by foods. Basic five food groups – Cereals, pulses, fruits and vegetables, milk and meat, fats and sugar

UNIT II: Nutrients and Health (40 Hours)

1. Water – Importance, distribution in body, function, sources, water balance, regulation and requirement, abnormalities in water balance.
2. Carbohydrates – Functions, sources, requirement, effects of deficiency. Fibers - Definition, classification, sources, role of fiber in human nutrition
3. Protein - Functions, sources, requirement, essential amino acids, determination of nutritional quality of proteins.
4. Fats and Lipids – Functions, sources, role of essential fatty acids, Health concerns in lipid nutrition-obesity, hypertension, atherosclerosis, requirements and effects of deficiency.
5. Vitamins – Classification, sources, requirement, deficiency of Vitamin A, D, E, K, Ascorbic acid, Thiamine, Riboflavin, Niacin, Pyridoxine, Folic acid, Pantothenic acid.
6. Minerals – Functions, sources, deficiency of calcium, phosphorus, sodium,

potassium, iron, iodine and fluorine.

UNIT III: Balanced Diet (10 Hours)

1. Meal planning, factors affecting meal planning, principles of meal planning.
2. Factors affecting RDA

References:

1. Mudambi S R and Rajagopal M V (1995), Fundamentals of Food & Nutrition, 5th Edition, New Age International Pvt Ltd.
2. Raheena B M (2009) A text book of foods, Nutrition and Dietetics, 3rd Edition, Sterling Publishers.
3. Swaminathan M (2012), Handbook of Food and Nutrition, Bangalore Printing and Publishing.

Food Preservation

Course Code: SDC3FP11

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To make students understand about the mechanism of spoilage and deterioration in foods.
- The basic food preservation principles,
- To understand the principles behind the various methods of food preservation

Course outcomes

- Understand the mechanism of spoilage and deterioration in foods.
- Understand different principles and methods of food preservation

Course Outline

UNIT I: Food Spoilage (5 Hours)

1. Definition, types of spoilage - physical, enzymatic, chemical and biological spoilage.

Mechanism of spoilage and its end products, shelf life determination

UNIT II: Preservation by using preservative (10 Hours)

1. Food preservation: Definition, principles, importance of food preservation, traditional and modern methods of food preservation. Food additives – definition, types, Class I and Class II preservatives.

UNIT III: Preservation by use of high temperature (10 Hours)

1. Pasteurization: Definition, types, Sterilization, Canning - history and steps involved, spoilage encountered in canned foods, types of containers used for canning foods.
2. Food irradiation – Principles, merits and demerits, effects of irradiation and photochemical methods.

UNIT IV: Preservation by use of low temperature (15 Hours)

1. Refrigeration - advantages and disadvantages, freezing: Types of freezing, common spoilages occurring during freezing, difference between refrigeration and freezing.

UNIT V: Preservation by removal of moisture (15 Hours)

1. Drying and dehydration - merits and demerits, factors affecting,
2. Different types of drying, Concentration: principles and types of concentrated foods.
3. Preservation by Fermentation

UNIT VI: Recent Methods in Food Preservation (5 Hours)

1. Pulsed electric field processing, High Pressure Processing, Processing using Ultra Sound, Dielectric, Ohmic and Infrared Heat.

References:

2. Krammer A (1970), Quality Control in Food Industry. Vol. I, 3rd edition, AVI Publishers.
3. Gould G W (2012), New Methods of food preservation, Springer Science & Business Media.
4. N Shakuntalamanay and M Shadakshara Swamy (2001) Food Facts and Principles, 2nd Edition, New Age International Publishers.
5. Srilakshmi B (2018), Food Science, 7th Edition, New Age International Publishers.
6. Subalakshmi G and Udipi S A (2006), Food processing and preservation, 1st Edition, New Age International Publishers.

Fruits and Vegetables Processing Technology

Course Code: SDC3FP12

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To acquaint with the proper handling technologies of fruits and vegetables to reduce post-harvest losses.
- To acquaint with principles and methods of preservation of fruits and vegetables into various products.

Course outcomes

- Acquaint proper handling technologies of fruits and vegetables to reduce post-harvest losses
- Acquaint principles and methods of preservation of fruits and vegetables

Course Outline

UNIT I: Primary Processing of fruits (10 Hours)

1. Grading, sorting, cleaning, washing, peeling, slicing and blanching. Tomato products.
2. Dried fruits - Dehydration of fruits and vegetables using various drying technologies like sun drying, solar drying, osmotic, tunnel drying, fluidized bed drying, freeze drying.

UNIT II: Processing Juices (25 Hours)

1. Processing of juices: Processing of vegetable juice, Processing of fruit juice
Manufacturing of fruit juices concentrates, puree and pastes.
2. Preparation of jam, jellies and marmalades.
3. Pectin chemistry, Common preservatives used in juices, jam and jellies, defects in jams, jellies and pickles.

UNIT III: Preserved fruits (25 Hours)

1. Preparation of preserve and candied fruits, Pickling of fruits and vegetables. Waste management in fruits and vegetable processing unit

2. Re-packaging of Fresh fruits and vegetables. Storage techniques for fresh fruits and vegetables.
3. Canning of fruits and vegetables.

References:

1. Fennema R O (1975), Physical principles of food preservation, Marcel Dekker Inc
2. K. Sanjeev & Srivastava R.P (2016), Complete Technology Book on Processing Dehydration Canning and Preservation of Fruit & vegetables, 3rd Edition, NIIR Project Consultancy Services.

Fruits and Vegetable Processing Technology (Practical)

Course Code: SDC3FP13(P)

Contact Hours per Week: 5

Number of Credits: 5

Number of Contact Hours: 75

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To determine different constituents in preserved food
- To gain practical knowledge about processing of fruits and vegetables

Course outcomes

- Develop skills in preserving various fruits and vegetables
- Analyze the chemical properties of jams, jellies, squashes etc.

Course Outline

1. Determination of ascorbic acid, acidity, total soluble solid.
2. Estimation of tannin
3. Evaluation of pectin content.
4. Preparation and quality evaluation of fruit jam, fruit jelly, fruit marmalade;
5. Processing of tomato products; Ketchup
6. Preparation of dehydrated vegetables.
7. Estimation of salt in pickles

8. Lye peeling methods in fruits and vegetables
9. Adequacy of blanching
10. Determination of chemical preservatives- benzoic acid, KMS
11. Visit to commercial storage, and canning unit.

References:

1. Lal G, Siddapa GS & Tandon GL (2009) Preservation of Fruits and Vegetables, ICAR.
2. Verma L R and Joshi V K (2000), Post-Harvest Technology of Fruits and Vegetables. Indus Publishing Company.

Food Preservation and Beverages (Practical)

Course Code: SDC3FP14(P)

Contact Hours per Week: 5

Number of Credits: 5

Number of Contact Hours: 75

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To acquaint different methods of preservation
- To prepare different beverages

Course outcomes

- Analyse the chemical aspects of various preserved foods.
- Develop skill in various preservation /processing methods

Course Outline

1. Preservation by high temperature
2. Preservation by low temperature
3. Preservation using dehydration
4. Estimation of purity of KMS
5. Qualitative determination of SO₂

6. Qualitative estimation of Benzoic acid
7. Estimation of reducing sugar
8. Sensory evaluation Dehydration of fruits in sugar syrup
9. Drying Kinetics of vegetables using cabinet drier
10. Determination of moisture content
11. Estimation of alcoholic content Food Beverage Technology Practical
12. Chemical and microbiological analysis of raw water quality;
13. Preparation of common beverages
14. Preparation of regional fruit juices;
15. Preparation of whey-based beverages;
16. Preparation of crush, nectar, blended juice
17. Preparation of soy milk, fruit milkshakes, herbal beverages;
18. Visit to relevant processing units.

References:

1. Vijaya K (2011), Textbook on Food storage and preservation, Kalyani Publishers.
2. Srilakshmi B (2018), Food Science, 7th Edition, New Age International Publishers.
3. Fennema R O (1975), Physical principles of food preservation, Marcel Dekker Inc
4. K. Sanjeev & Srivastava R.P (2016), Complete Technology Book on Processing Dehydration Canning and Preservation of Fruit & vegetables, 3rd Edition, NIIR Project Consultancy Services
5. Desrosier (2006), Technology of Food preservation, 4th edition, CBS Publishers.

Semester IV

Entrepreneurship Development

Course code: A13

Hours per week: 4

Number of Credits: 4

Number of contact hours: 60

Course evaluation: Internal: 20, External: 80

Objectives:

- To familiarize the students with the concept of entrepreneurship.
- To identify and develop the entrepreneurial talents of the students.
- To generate innovative business ideas in the emerging industrial scenario.

Course Outcomes:

- Able to understand the nature of entrepreneurship and the financial assistance and guidance from the government.
- Confirm an entrepreneurial business idea
- Explore entrepreneurial leadership and management style.
- Confidence in Setting up of Industrial unit.

Course outline

UNIT I (15Hours)

1. Concepts of entrepreneur: Entrepreneur- Definitions - Characteristics of entrepreneur
Classification of entrepreneur-Entrepreneurial traits -Entrepreneurial functions - role of entrepreneurs in the economic development - Factor effecting entrepreneurial growth – Entrepreneurship – Meaning – definition - Entrepreneur vs Intrapreneur – Women Entrepreneurs - Recent development – Problems - Entrepreneurial Development Programmes - Objectives of EDP - Methods of training - Phases of EDP.

UNIT II (17 Hours)

1. Institutional support and incentives to entrepreneurs- Functions of Department of Industries
2. and Commerce (DIC) - Activities of Small Industrial Development Corporation (SIDCO)- Functions of National Small Industries Corporation(NSIC)- Functions of Small Industries Development Bank of India (SIDBI) - Khadi Village Industry Commission (KVIC)-Small Industries Service Institute (SISI)- Functions and services of Kerala Industrial Technical Consultancy Organisation (KITCO)-Activities of Science and Technology Entrepreneurship
3. Development Project (STEDP)-Strategies of National entrepreneurship Development Board
4. (NEDB) -Objectives of National Institute for entrepreneurship and small business

development (NIESBUD) - Techno park-Functions of techno park Incentives- Importance
Classification of incentives – Subsidy - Types of Subsidy

UNIT III (15 Hours)

1. Micro Small and Medium Enterprises- Features- Objectives- Importance- Role of SME in the economic development- MSME Act 2006- Salient features- Credit Guarantee Fund Trust Scheme for MSMEs - Industrial estates-Classification-Benefits- Green channel-Bridge capital- Seed capital assistance-Margin money schemes –Single Window System-Sickness Causes –Remedies- Registration of SSI

UNIT IV (18 Hours)

1. Setting up of Industrial unit-(Only Basic study) Environment for Entrepreneurship – Criteria for selecting particular project- Generating project ideas-Market and demand analysis Feasibility study- Scope of technical feasibility- Financial feasibility- Social cost benefit analysis-Government regulations for project clearance-Import of capital goods-approval of foreign collaboration-Pollution control clearances- Setting up of micro small and medium enterprises-Location decision- Significance.

UNIT V (15 Hours)

1. Project Report - Meaning-Definition - Purpose of project reports-Requirements of good report - Methods of reporting - General principles of a good reporting system - Performa of a project report - Sample project report. (The preparation of sample project report shall be treated as an assignment of this course).

Reference:

1. Shukla M.B. Entrepreneurship and small Business Management, Kitab Mahal Allahabad.
2. Sangram Keshari Mohanty, Fundamentals of entrepreneurship, PHI, New Delhi.
3. Nandan H. Fundamentals of Entrepreneurship, PHI, New Delhi.
4. Small-Scale Industries and Entrepreneurship, Himalaya Publishing, Delhi
5. C.N.Sontakki, Project Management, Kalyani Publishers, Ludhiana.
6. Sangam Keshari Mohanty. Fundamentals of Entrepreneurship, PHI, New Delhi
7. Peter F. Drucker- Innovation and Entrepreneurship.
8. Vasanth Desai, Small Business Entrepreneurship, Himalaya Publications.
9. MSME Act 2006.

Course code: A14

Number of hours per week: 4

Number of credits: 4

Number of contact hours: 60

Course evaluation: Internal: 20, External: 80

Objectives

- To understand the importance of health and measures taken by the authorities
- To understand the different aspects of hygiene and sanitation.
- To get knowledge on occupational health, safety and environment

Course outcome:

- Identify the diseases associated with occupation
- Identify the hazard in industrial area and propose preventive measures
- Manage safety in industries and propose safety measures and PPE
- Demonstrate the hygiene and sanitation procedures
- Demonstrate the microorganism responsible for the disease and their control

Course outline

UNIT I (12 hours)

1. Health-Physical, Mental, Social – Positive health– Quality of life Index.
2. Health programmes: Health programmes control measures in operation in India - Tuberculosis, poliomyelitis, leprosy, filariasis and diphtheria. Health situation in India – Health Problems-Primary health care in India – PHCs National Programmes for elimination of diseases. - Water borne diseases and air borne diseases. Methods of disease transmission.

UNIT II (12 hours)

1. Sanitation: Definition and meaning. Microbial growth pattern and factors affecting microbial proliferation.
2. Sewage Disposal : disposal of sewage and night soil – treatment of sewage system
3. Waste disposal- Disposal of solid waste; Waste water handling: Pre-treatment, primary treatment, secondary treatment, tertiary treatment and disinfection.
4. Water -supply sources – impurities and purification of water

UNIT III (14 hours)

1. Contamination: Sources of contamination and protection against contamination.
2. Methods of killing micro-organism- Use of heat, chemicals and radiation. Methods of inhibiting microbial growth- Use of refrigeration, chemicals, dehydration and fermentation
3. Principles of hygiene: General principles of hygiene – its relation to food preparation and food handling habits.
4. Personnel hygiene- Meaning and importance; Hygienic practices of employees; personal hygiene and contamination of food products-Sanitation Training and Education for Food Service Workers

UNIT IV (12 hours)

1. Food Borne infection, intoxication: Food poisoning – causes and types – Definition, Exotoxin, Endotoxin, intoxications control measures food borne intoxication and infection – sources – effects and prevention. symptoms and control: Botulism, Staphylococcus, E.coli and salmonella. Food infections – sources, symptoms Methods of Prevention and investigation of food borne disease outbreak

UNIT V (14 hours)

1. Occupational Safety, Health and Environment: Definition-safety at work place- safe use of machines and tools-hazard-physical hazard (noise, radiation, fire, Electrical, illumination)-chemical hazard-biological hazard-Personal Protective Equipment - Accident preventive techniques-First Aid-Plant Layout for safety-safety of different sectors

References:

1. Parke. K. 2007. Text book of preventive and Social Medicine 19th Edition, M/s. Banaraisdasis Bhanet Publishers, Jabalpur, India.
2. William, C., Frazier and Dennie. C Westheff. 1996. Food Microbiology 4th Edition, Tata McGrahill Company Limited
3. S.Roday – Food Hygiene and Sanitation
4. M. Jacob. (1989) – Safe food Handling.
5. V.N. Reinhold – Principles of Food Sanitation
6. B.C.Hobbs & R.J.Gilbert – Food Poisoning and Hygiene.

Course Code: GEC4RM02

Contact Hours per Week: 3

Number of Credits: 3

Number of Contact Hours: 45

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives:

- To understand the methodology of research its principles and techniques
- Developing and understanding research from a report writing

Course outcomes

- Understand the fundamentals & different types of research
- Understand the necessity of defining research problems & technique involved in defining a research problem.
- Develop the knowledge in design & proposal of a research
- Understand the different types & methods of data collection in research
- Understand the different research tools used in research methodology.
- Understand the sampling methods and report writing of a research work.

Course Outline

UNIT I: Fundamentals of Research (5 Hours)

1. Definition of research, objectives, characteristics and types – action research, applied research, exposit facto research, historical research, fundamental research

UNIT II: Defining Research Problem (5 Hours)

1. Definition and selection, necessity of defining the problem, technique involved in defining a problem.

UNIT III: Research design/Proposal (10 Hours)

1. Meaning and purpose of a research design or proposal, research problem definition, identification, statement of research problem, criteria for selection, definition of concepts (operational definition). Variables - types of variables, independent and dependent variables, control and intervening variables. Hypothesis and related literature –Meaning.

UNIT IV: Methods of Data Collection (10 Hours)

1. Collection of primary data – observation method, Interview method, collection of Data through questionnaires and schedules, other methods of data collection, collection of secondary data.

UNIT V: Research Tools (5 Hours)

1. Questionnaire, observation, interview schedule and other tools used.

UNIT VI: Sampling (5 Hours)

1. Sampling methods, merits and demerits of sampling

UNIT VII: Research Report Writing (5 Hours)

1. Principle of research report, contents in a report

References:

1. Kothari C R and Gaurav G (2019) Research Methodology: Methods And Techniques, Fourth edition, New Age International Publishers
2. Best W J, Kahn V J and Jha A K (2016) Research in Education, 10th edition, Pearson Education
3. Koul L (2009) Methodology of Educational Research, 4th edition, Vikas publishing house pvt ltd., New Delhi

Byproduct Utilization and Waste Management

Course Code: SDC4FP15

Contact Hours per Week: 3

Number of Credits:

Number of Contact Hours: 45

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives:

- To identify types of wastes in food industry
- To gain knowledge in different effluent treatment methods
- To utilize the byproduct in the food industry

Course outcomes

- Understand the types & magnitude of waste generation in food industries

- Understand the characterisation of waste & waste water
- Understand the effluent treatment process & different levels of water treatment in food industries.
- Understand the Characterization and utilization of by-products from agriculture products
- Understand the waste Utilization of animal and marine product industries

Course Outline

UNIT I: Introduction (5 Hours)

1. Types of waste and magnitude of waste generation in different food processing industries, concept, scope and importance of waste management and effluent treatment

UNIT II: Waste Characterization (10 Hours)

1. Temperature, pH, Oxygen demands (BOD, COD, TOD), fat, oil and grease content, metal content, forms of phosphorous and sulphur in waste waters, microbiology of waste, other ingredients like insecticide, pesticides and fungicides residues

UNIT III: Effluent Treatment (10 Hours)

1. Pretreatment of waste: sedimentation, coagulation, flocculation and floatation
Secondary treatments: Biological oxidation trickling filters, activated sludge process), industrial wastewater treatment: characteristics of industrial wastewater, treatment levels

UNIT IV: Waste Utilization of agro Industries (10 Hours)

1. Characterization and utilization of byproducts from cereals (breweries), pulses, oilseeds, fruits & vegetables (wineries) and plantation crops (sugar industries).

UNIT V: Waste Utilization of animal and marine product industries (10 Hours)

1. Characterization and utilization of byproducts from dairy, eggs, meat, fish and poultry.

References:

1. Abbas K and Peter S (2013), The Economic Utilisation of Food Co-Products, Royal Society of Chemistry Publishing.
2. Martin A M (2012), Bioconversion of Waste Materials to Industrial Products, 2nd edition, Springer Science & Business Media Publishing.
3. Marcos V S (2007), Basic Principles of Wastewater Treatment, IWA Publishing

Food Packaging and Labelling

Course Code: SDC4FP16

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To provide knowledge about trends and development in food packaging technologies and materials
- To familiarize with the different materials and methods used for packaging.
- To understand the technology behind packaging and packaging materials

Course outcomes

- Understand the basic functions & different levels of food packaging
- Develop the knowledge in food deterioration, deterioration determination tests & its control methods
- Understand the types & properties of different kind of packaging materials used in food industries.
- Develop the knowledge in recent technology used in food packaging.
- Understand the labelling process and safety concerns in food packs.

Course Outline

UNIT I: Introduction to Packaging (10 Hours)

1. Definition, Functions of packaging – Containment, Protection, Preservation, Promotion, Convenience, Communication. Requirements of effective package,
2. Types of food packaging- primary, secondary and tertiary packaging.

UNIT II: Deteriorative Reactions and shelf life foods (10 Hours)

1. Introduction, deteriorative Reactions in food- factors affecting deterioration of foods- physical changes, biological changes, chemical changes. Shelf life of foods
2. Definition, intrinsic and extrinsic factors controlling the rate of reactions. Shelf life determination tests

UNIT III: Packaging Materials and their properties (13 Hours)

1. Rigid containers- Glass, Wooden boxes, metal cans- Aluminium and tin plate containers,
2. Semi rigid containers- paperboard cartons, Flexible packaging- paper, plastic pouches- Low density polyethylene, High density polyethylene and
3. Polypropylene. Packaging materials for dairy products, bakery and confectionary, granular products, fruits and vegetables.

UNIT IV: Special Packaging (12 Hours)

1. Aseptic packaging, Active packaging, Intelligent packaging, Modified atmospheric packaging and controlled atmospheric packaging, Shrink packaging, stretch packaging, Biodegradable packaging, Edible packaging, Tetrapacks.

UNIT V: Labelling and safety concerns in food pack (15 Hours)

1. Printing process, inks, adhesives, labelling, coding- bar codes, Food packaging closures of glass and plastic containers, Legislative and safety aspects of food packaging,
2. Machineries used in Food Packaging, Package testing-Thickness – Paper density - Basis weight – Grammage - Tensile Strength - Gas Transmission Rate (GTR) - Water Vapour Transmission Rate (WVTR).

References:

1. Robertson G L (2013) Food Packaging: Principles and Practice, Third Edition, CRC Press.
2. Kadoya T (1991), Food Packaging, 1st edition, Academic press.

Food Microbiology

Course Code: SDC4FP17

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To make students understand the food and industrial microbiology and to make

them aware about the importance of food quality control by avoiding pathogenic microbial attack.

- Identify ways to control microorganisms in foods.

Course outcomes

- Understand the food and industrial microbiology and to make them aware about the importance of food quality control by avoiding pathogenic microbial attack.
- Develop the knowledge to identify different ways to control microorganisms in foods
- Understand the different source & characteristics of microorganisms involved in food spoilage
- Understand internal & external factors for growth of micro organisms
- Understand the microbial spoilage in different food groups
- Develop the knowledge of various benefits & industrial applications of microorganisms in food industries
- Develop the knowledge of microbiological testing of milk& water.

Course Outline

UNIT I: Introduction to food microbiology (10 Hours)

1. History, current status, role of food microbiology, sources of micro-organisms in food, changes caused by microorganisms - food fermentation, putrefaction, lipolysis. Growth and survival of microorganisms in foods, biological, chemical and physical changes caused by microorganisms, physical and chemical methods to control microorganisms.

UNIT II: Characteristics of micro-organisms (15 Hours)

1. Classification of microorganisms, nomenclature, morphology – yeast and moulds, bacterial cells, viruses. Important microbes in food, microbial growth characteristics – Microbial reproduction, nature of growth in food. Food hygiene and sanitation: Contamination during handling and processing and its control; indicator organisms.

UNIT III: Factors in microbial growth (10 Hours)

1. Factors influencing microbial growth in food: Intrinsic and extrinsic factor Hydrogen ion concentration, Moisture requirement, concept of water activity, temperature, oxidation reduction potential, inhibitory substances and biological structure. Principles of different food preservation methods.

UNIT IV: Spoilage in different food groups (10 Hours)

1. Food spoilage – Introduction, spoilage in cereals, vegetables and fruits, meat, eggs, poultry, fish, milk and milk products, canned foods, nuts and oil seeds, fats and oil seeds. Definition - food infection and food intoxication.

UNIT V: Beneficial uses of microorganisms (10 Hours)

1. Microorganisms used in food fermentation, mechanisms of nutrient transport, application in genetics, intestinal bacteria and probiotics, food bio preservatives of bacterial origin, food ingredients and enzymes of microbial origin.
2. Economic importance of microorganisms.

UNIT VI: Microbial Testing (5 Hours)

1. Water and Milk

References:

1. Bibek R and Bhunia A (2017) Fundamental Food Microbiology, CRC Press.
2. Adams M R and Moss M O (2018), Food Microbiology, New Age International Publishers

Food Microbiology (Practical)

Course Code: SDC4FP18(P)

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To analyze the chemical constituents in food and to understand the basic concepts of food microbiology.
- To introduce basics of food microbiology

Course outcomes

- Acquire practical knowledge in microbiology testing of sampling & testing of different food groups
- Develop the practical knowledge in fundamental aspects of a food microbiology labDevelop the practical knowledge in sterilization methods, microbiological media ,staining & culture techniques

- Develop the practical knowledge for isolation & identification of common pathogenic bacteria found in high-risk food.
- Develop the practical knowledge in microbiological testing of water sample

Course Outline

1. Introduction to the Basic Microbiology Laboratory Practices and Equipments
2. Functioning and use of compound microscope
3. Cleaning and sterilization of glassware
4. Preparation and sterilization of nutrient broth.
5. Preparation of slant, stab and plates using nutrient agar.
6. Standard Plate Count Method
7. Staining techniques - simple staining, gram staining
8. Isolation of pure culture: Pour plate, Streak plate Microbial analysis of meats – Total plate count - Staphylococcus Microbial analysis of Milk – Total plate count, Yeast and Mold.
9. Microbial analysis of water – Coliforms

References:

1. Pelzar M J, Chan E C and Krieg N R (2001) Microbiology, 5th edition, McGraw Hill Education
2. Black J G (2001) Microbiology Principles & Applications, 4th Edition edition, John Wiley & Sons
3. Sullia S B and Santharam S (1998) General Microbiology, Science Publishers
4. Frazier W C and Westhoff D C (2017) Food Microbiology, Fifth edition, Mc Graw Hill Education
5. Banwart G J (1979) Basic Food Microbiology, Avi Publishing Co Inc.
6. Adams M R and Moss M O (2018), Food Microbiology, New Age International Publishers
7. Sharma K (2007) Manual of Microbiology, Ane Books India

Internship (Project Report)

Course Code: SDC4FP19(P)

Number of Credits: 4

Course outcomes

- Develop real world experience in food sectors

Course Outline

1. HACCP – Evaluation of food establishment and submission of report.
2. Quality auditing – Audit plan preparation and conduct of audit in food processing establishments and submission of report.
3. Evaluation of other food safety management systems in any one of the food manufacturing/ packaging/Supply chain/ retail/other areas and submission of report.

Semester V

Business Management

Course Code: SDC5FP20

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To familiarize the students with concepts and principles of Management
- Ability to create and deploy websites using CMS, including creating and editing content, adding functionality, and creating custom templates and themes.

Course outcomes

- Understand the concepts and principles of food business Management
- Understand the principle, scope & functional areas in business management.
- Understand the nature, types, features & steps involved in a business.
- Understand the principles in organising & staffing of a business management
- Understand the importance of direction, controlling & coordination in business management.

- Understand the Basic concepts of plant layout and design with special reference to food process industries.

Course Outline

UNIT I: Management(12 Hours)

1. Introduction, Meaning, nature and characteristics of Management - Scope and functional areas of management - Management as a science art or profession –
2. Management & Administration – Principles of management - Social responsibility of management. -Contributions of F. W. Taylor and Henry Fayol - Emergence of Japan as an industrial giant.

UNIT II: Planning (8 Hours)

1. Nature, importance and purpose of planning - Planning process, objectives - Types of plans MBO-Features-steps.

UNIT III: Organising and Staffing (12 Hours)

1. Nature and purpose of organisation, Principles of organisation - Types of organization, Organisation Chart-Organisation manual-
2. Departmentation, Committees Authority- Delegation of Authority- Responsibility and accountability-Centralisation Vs decentralisation of authority - Nature and importance of staffing - Process of selection & recruitment.

UNIT IV: Directing (16 Hours)

1. Meaning and nature of directing - Motivation- meaning - importance-Theories of Motivation (Maslows, Herzberg, McGregor s, X & Y theory) Leadership-Meaning-Styles
2. Managerial Grid by Blake and Mounon - Likert s Four level model- Coordination-Meaning and importance.

UNIT V: Controlling (12 Hours)

1. Meaning and steps in controlling - Essentials of a sound control system - Methods of establishing Control-Control by Exception.

References:

1. Koontz C and Donnell H O (1974) Essentials of Management, McGraw-Hill publishers
2. Prasad L M (2011) Principles and practice of management, Sultan Chand & Sons

Food Engineering

Course Code: SDC5FP21

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To impart knowledge regarding the technological knowledge transfer essential to the cost-effective production and commercialization of food products and services.
- To impart knowledge regarding various thermal processing techniques

Course outcomes

- Understand the technological knowledge transfer essential to the cost-effective production and commercialization of food products and services
- Impart the knowledge regarding various thermal processing techniques
- Understand the Unit operations and Heat Transfer Mode used in food preservation & types of heat exchangers used in food processing sectors.
- Understand the working principles & applications of freezers, refrigerators, boilers & driers used in food industries
- Understand the rheological properties of foods.

Course Outline

UNIT I: Unit Operations & Heat Transfer (10 Hours)

1. Unit operations and Heat Transfer Mode of heat transfer – Conduction, Convection, radiation.

UNIT II: Heat Exchanger (15 Hours)

1. Classification, contact type heat exchange - Immersion, Non-contact type heat exchanger, Plate Heat exchanger, Scraped surface Heat exchanger, Tubular Heat exchanger, Double & Triple tube Heat exchanger, Shell & Tube Heat Exchanger
Pasteurization HTST, UHT, Pasteurizing equipments.

UNIT III: Refrigeration & Freezing (10 Hours)

1. Refrigeration Principle of refrigeration, Vapour compression refrigeration cycle
Freezing Principle of freezing & freezing rate

UNIT IV Evaporation (5 Hours)

1. Principle, single effect evaporation, multiple effect evaporation, Types of evaporators - Horizontal tube, Vertical tube, Falling film evaporator, Raising film evaporator.

UNIT IV: Driers & Boilers (15 hours)

1. Driers Principle, constant rate & falling rate of period of drying, Types of driers - Drum drier, Cabinet drier, Tunnel drier, Spray drier, Fluidized bed drier Boiler Principle, working of water tube & fire tube boiler

UNIT V: Rheology (5 Hours)

1. Definition, Rheological characteristics of foods, viscosity, apparent viscosity Newtonian and Non Newtonian

References:

1. Sahay K M and Singh K K (2004) Unit operations of Agricultural processing, 2nd edition, Vikas Publishing House Pvt Ltd
2. Singh P R and Heldman D R (2009) Introduction to Food Engineering, 4th edition, Academic Press is an imprint of Elsevier
3. Macabe W L, Smith J C and Hariot P (1993) Unit Operations of Chemical Engineering, McGraw-Hill College

Food Chemistry

Course Code: SDC5FP22

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To Impart knowledge regarding macronutrients

Course outcomes

- Understand the chemical nature & structure food macronutrients
- Understand the classification & physicochemical properties of food molecules
- Understand the different forms & chemical properties of water
- Understand the different kind of natural flavouring substances & pigments present in foods.
- Understand the different properties of foods.
- Understand the different instrumental & sensory analysis of foods

Course Outline

UNIT I: Carbohydrates, Proteins, fats & Enzymes (30 Hours)

1. Carbohydrates – Classification, Structure, browning reaction, changes during cooking Pectin – Composition & structure
2. Protein – Introduction to food proteins, classification, structure, physico chemical properties, denaturation, reactions, protein determination, changes during cooking
3. Fats & Oils – Classification, saturated, unsaturated, polyunsaturated fatty acids physical and chemical properties, refining of fats and oils, -bleaching, deodorizing, hydroxylation, shortening, Products of fat - margarine, vanaspati, lard, tallow.
4. Enzymes – Classification, nomenclature, enzyme specificity, factors affecting enzyme activity, enzyme inhibition, role in food processing
5. Water Introduction, physical and chemical properties of water, moisture in foods, hydrogen bonding, bound water

UNIT II: Pigments and flavours (20 Hours)

1. Pigments - Pigments in foods, chlorophyll, flavanoids, anthocyanin, anthoxanthins, quinines, xanthones, betalains, Effect of processing and storage on pigments, physical and chemical properties
2. Flavours - Flavour compounds in foods - terpenoids, flavanoids, and sulphur compounds, effect of processing and storage on flavours

UNIT III: Properties of foods (5 Hours)

1. Colloids – Properties, sols, gels, foam, emulsion and suspension

UNIT IV: Instrumentation (5 Hours)

1. Instrumentation - Instrumentation for food quality assurance; subjective and objective parameters.
2. Gas chromatography, Liquid chromatography, HPLC

References:

1. Fatih Y (2009) Advances in Food Biochemistry 1st edition, CRC Press, New York.
2. Damodaran S, Parkin K L and Fennema, O R. (2007) Fennema's Food Chemistry, 4th edition, CRC press, New York
3. Campbell M K and Farrell S O (2017), "Biochemistry", 9th edition, Cengage Learning Publishers, USA.
4. Shakuntalamanay N and Shadakshara Swamy M (2001) Food Facts and Principles, 2nd Edition, New Age International Publishers.
5. Meyer L H (2002) Food Chemistry, CBS publishers and Distributors, New Delhi.

Food Plant Designing and Layout

Course Code: SDC5FP23

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To understand concepts of plant layout.
- To have knowledge on building, utilities in the plant.
- To know the importance of proper food plant design and safety.

Course outcomes

- Understand the Basic concepts of plant layout and design with special reference to food process industries.
- Develop the knowledge for the Preparation of a Plant Layout, Plant Layout problem, importance, objectives, classical types of layouts & Evaluation of layout.
- Understand the major considerations in building design, type of factory buildings, choice of building construction, material for floors & foundation.

Course Outline

UNIT I: Introduction (15 Hours)

1. Definition, Basic concepts of plant layout and design with special reference to food

process industries. Application of HACCP concept, ISO, FPO & MPO requirements in food plant layout and design.

UNIT II: Plant Location (15 Hours)

1. Influence of location on plant layout, location factors, location theory and models, Economic plant size, types of manufacturing processes like continuous, repetitive and intermittent processes.

UNIT III: Plant Layout (10 Hours)

1. Preparation of a Plant Layout, Plant Layout problem, importance, objectives, classical types of layouts. Evaluation of layout. Advantages of good layout

UNIT IV: Plant Building (10 Hours)

1. Considerations in building design, type of factory buildings, choice of building construction, material for floors, foundation, walls, doors, windows, drains etc, ventilation, fly control, mold prevention and illumination in food processing industries

UNIT V: Plant Layout & Equipment Layout (10 Hours)

1. Plant layout and design of bakery and biscuit industries; fruits and vegetables processing industries including beverages; milk and milk products; meat, poultry and fish processing industries

References:

1. John H and Lelieveld H L M (2011) Hygienic Design of Food Factories, 1st edition, Woodhead Publishing
2. Clark J P, (2008) Practical Design, Construction and Operation of Food Facilities, 1st edition, Academic Press Publishers.
3. Maroulis Z B and Saravacos G D (2007) Food Plant Economics, CRC Press Publishers
4. Lopez-Gomez A and Barbosa-Canovas G V (2005) Food Plant Design, 1st edition, CRC Press Publishers.

Animal Food Processing

Course Code: SDC5FP24

Contact Hours per Week: 4

Number of Credits: 4

Number of Contact Hours: 60

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To understand need and importance of livestock, egg and poultry industry
- To study structure, composition and nutritional quality of animal products.

Course outcomes

- Understand the need and importance of livestock, egg and poultry industry
- Understand the structure, composition nutritional quality & properties of animal products.
- Develop the knowledge of different preservation methods employed in fish processing.
- Understand the various parameters for meat quality assessment.
- Understand the composition and nutritive value, factors affecting egg quality & Preservation of eggs
- Understand the various value added products from fish, egg etc.

Course Outline

UNIT I: Introduction to Animal Foods (15 Hours)

1. **Fish**-Classification of fish (fresh water and marine), composition, spoilage of fish - microbiological, physiological, biochemical.
2. **Meat** - Definition of carcass, concept of red meat and white meat, composition of meat, marbling in meat, post mortem changes in meat - rigor mortis, tenderization of meat, ageing of meat.
3. **Egg**- composition and nutritive value, egg proteins, characteristics of fresh egg, deterioration of egg quality

UNIT II: Preservation of Fish (10 Hours)

1. Chilling, Freezing, curing, drying, salting - salting methods: brining, pickling, curing and canning of fish. Smoking - smoke production, smoke components Quality, safety and nutritive value of smoked fish, pre - smoking processes, smoking process control.

UNIT III: Meat Quality and preservation (15 Hours)

1. **Meat Quality**: colour, flavour, texture, Water Holding Capacity (WHC), Emulsification capacity of meat.

2. Tests for assessment of raw meat - TVN, FFA, PV, Nitrate and nitrite in cured meat.
3. **Preservation of meat** -Refrigeration and freezing, thermal processing - canning of meat, dehydration, meat curing.

UNIT IV: Egg quality and preservation (10 Hours)

1. Composition and nutritive value. Factors affecting egg quality.
2. Preservation of eggs - Refrigeration and freezing, thermal processing, dehydration, coating.

UNIT V: Animal Food Products (10 Hours)

1. **Fish products** - Surimi - Process, traditional and modern production lines, quality of surimi products. Fish protein concentrates (FPC), fish protein extracts (FPE).
2. **Meat products**- Sausages- processing, RTE meat products.
3. **Egg products**– Egg powder, frozen egg pulp, designer eggs.

References:

1. Govindan T K (1985) Fish Processing Technology, Oxford & IBH publishing
2. Hui Y H (2001) Meat Science and Applications, 1st edition, CRC Press
3. Kerry J, Kerry J and Ledward D (2002) Meat Processing improving quality, 1st edition, CRC Press.
4. Pearson A M and Gillett T A (2012) Processed Meat, Springer publishing

Animal Food Processing (Practical)

Course Code: SDC5FP25(P)

Contact Hours per Week: 5

Number of Credits: 5

Number of Contact Hours: 75

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To study about different meat products

Course outcomes

- Develop practical knowledge about different meat products

- Acquire a practical knowledge in slaughtering and dressing of animal carcass.
- Develop the practical knowledge in post-mortem analysis of meat, cutting & handling of meat
- Develop the practical knowledge in quality evaluation of meat &
- External and internal quality of egg.

Course Outline

1. Slaughtering and dressing of meat animals
2. Study of post-mortem changes; meat cutting and handling
3. Evaluation of meat quality
4. Evaluation of quality of eggs – external and internal
5. Preparation of meat, egg and fish products
6. Visit to meat processing plants

References:

1. Govindan T K (1985) Fish Processing Technology, Oxford & IBH publishing
2. Hui Y H (2001) Meat Science and Applications, 1st edition, CRC Press
3. Kerry J, Kerry J and Ledward D (2002) Meat Processing improving quality, 1st edition, CRC Press.
4. Pearson A M and Gillett T A (2012) Processed Meat, Springer publishing

Quantity Food Preparation (Practical)

Course Code: SDC5FP26(P)

Contact Hours per Week: 5

Number of Credits: 5

Number of Contact Hours: 75

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objectives:

- To get an experience for Quantity cooking Practicals

Course outcomes

- Experience the various quantity-cooking practical.
- Development & Standardization of selected recipes used in food service institutions and quantity

food production and its sales

- Acquire skill in Plate Presentation with appropriate garnishes & Buffet Presentation

Course outline

1. Standardization of 10 selected recipes used in food service Institutions and quantity food production of any two items and its sales.
2. Plate Presentation with appropriate garnishes and accompaniments
3. Buffet Presentation

Semester VI

Term Paper

Number of Credits: 2

Course Code:SDC6FP27(P)

Internship and Project

Number of Credits: 28

Course Code:SDC6FP28(Pr)

Course outcomes

- Develop hands on skill in various food processing sectors.
- Integrate theory and practice

Model Question Papers

Vimala College (Autonomous) Thrissur

III semester B.Voc degree examination

Core course: B.Voc Food Processing

SDC3FP11- FOOD PRESERVATION

Time: 2.5 Hours

Maximum Marks: 80

Section A

Answer 15 questions. Each question carries 2 Mark

(15 x 2=30) (Ceiling Mark: 25)

1. Give an example for enzymatic spoilage.
2. List different types of spoilage.
3. Name any two methods of food preservation.
4. List any two-food additives.
5. Give example for any 2 class I preservatives.
6. Give examples of some refrigerants.
7. List any two sources of irradiation.
8. Give another name for canning.
9. What is the unit of radiation?
10. What is the temperature for sterilization?
11. Define water activity
12. What is IQF process
13. What is Pascalization?
14. Give two example for hurdle technology in food preservation
15. Define food fermentation, give examples

Section B

Answer 8 questions. Each question carries 5 Marks

(8 x 5=40) (Ceiling Mark: 35)

16. Define spoilage. Explain different types of food spoilage.
17. Comment on factors affecting the shelf life determination of a food item.
18. Give the importance and principles of food preservation.
19. Differentiate between drying and dehydration
20. Brief out any two modern methods of food preservation.
21. Write short note on cold sterilization
22. Describe different types of pasteurization.
23. Discuss about containers used for canning and lacquering.

Section C

Answer 2 questions. Each question carries 10 Marks

(2x10 = 20) (Ceiling mark: 20)

24. Elaborate on the mechanism of food spoilage.
25. Define Food Preservation. Explain various methods of food preservation.
26. What is canning? What are the steps involved in canning? Elaborate.
27. Define Freezing. Elaborate on types of freezing.

Vimala College (Autonomous) Thrissur
II semester B.Voc degree examination
Core Course: B.Voc Food Processing
SDC2FP08: DAIRY PRODUCTS AND PROCESSING

Time: 2 Hours

Maximum Marks: 60

Section A

Answer 12 questions. Each question carries 2 Mark

(12X2 = 24) (Ceiling Mark: 20)

1. Name different sources of Milk.
2. List out the factors affecting composition of milk
3. Expand UHT
4. Expand RMRD
5. List various parts of a filter
6. what is the SNF % in toned milk
7. Shrikhand is made from
8. List the main ingredients used for making ice cream
9. List various steps involved in cleaning
10. What are the agents used for cleaning a dairy plant?
11. Give FSSAI standard of Ghee
12. What is COB test?

Section B

Answer 7 questions. Each question carries 5 Mark

(7x5 = 35) (Ceiling Mark: 30)

13. Explain the effect of different compounds on milk
14. Elaborate on Clarification of milk
15. Explain HTST method of pasteurisation
16. What are the difference between standardised and homogenised milk?

-
17. Briefly explain the role of different constituents of Ice cream
 18. Explain the processing of paneer with the help of a flow diagram.
 19. Briefly explain In-Plant cleaning system.

Section C

Answer any 1 question. Each question carries 10 Marks (1x10 = 10) (Ceiling Mark: 10)

20. Explain processing of market milk on detail.
21. Elaborate on the manufacturing of cheese