

 SHIVAJI UNIVERISTY, KOLHAPUR-416 004. MAHARASHTRA

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 शिवाजी विद्यापीठ, कोल्हापूर – 416004.

 दुरध्वनी (ईपीएबीएक्स) २६०९००० (अभ्यास मंडळे विभाग– २६०९०९४)

 फॅक्स : ००९१-०२३१-२६९१५३३ व २६९२३३३.e-mail:bos@unishivaji.ac.in

Date 20/05/2022

No 0 0 3 9

SU/BOS/Sci & Tech/

To,

The Director, Departments of Technology, Shivaji University, Kolhapur.

Subject: Regarding revised syllabus of B. Tech. Programme (Department of Technology) Part-III (Sem-V-VI) under the Faculty of Science and Technology.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the revised syllabus B. Tech. Part-III (Sem-V-VI) under the Faculty of Science & Technology.

	b. Tech. Programme (Department of Technology)
1.	Civil Engineering
2.	Mechanical Engineering
3.	Computer Science and Technology
4.	Chemical Engineering
5.	Electronics and Communication Engineering
.6.	Food Technology

B. Tech. Programme (Department of Technology)

B. Tech Part-III (Sem-V-VI) all Branches syllabus and Rules, Regulation, Guidelines, Structure and equivalence shall be implemented from the academic year 2022- 2023 onwards. A soft copy containing syllabus is attached herewith and it is available on university website www.unishivaji.ac.in.

The question papers on the pre-revised syllabi of above mentioned course will be set for the two examinations. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

faithful Dy Registrar

Copy to:

1	The I/c Dean	6	Appointment Section	
	Faculty of Science & Technology			
2	The Chairpersan, Respective Board of Studies	7	Affiliation Section (T.1)	
3	Director, Examination and Evaluation	8	Affiliation Section (T.2)	
4	Eligibility Section	9	P.G.Admission Section	
5	O.E. – 4	100	P.G Seminar Section	



DEPARTMENT OF TECHNOLOGY, SHIVAJI UNIVERSITY KOLHAPUR THIRD YEAR B.TECH

Scheme of Teaching and Examination: Semester- V (Food Technology)

Course	Course Title	T	eacl wi	hing S th Cre urs / V	cheme dits Veek)	Examination Scheme (Marks)					
Code					,		Theory		Practical		
		L	T	Р	Credits	Scheme	Max. marks	Min. Passing	Scheme	Max. marks	Min. Passing
FT311	Food Quality and Safety Management	04	-	-	04	CIE SEE	30 70	40	-	-	-
FT312	Fruits and Vegetables Processing Technology	04	-	-	04	CIE	30 70	40	-	-	-
FT313	Dairy Technology	04	-	-	04	CIE	30 70	40	-	-	-
FT314	Food Process Engineering- II	04	-	-	04	CIE	30 70	40	-	-	-
FT315	Process Instrumentation, Dynamics and control	03	-	-	03	CIE	30 70	40	-	-	-
FT311L	Food Quality & Safety Management Laboratory	-	-	02	01	-	-	-	IOE	50	20
FT312L	Fruits& Vegetables Processing Technology Laboratory	-	-	02	01	-	-	-	EPE	50	20
FT313L	Dairy Technology Laboratory	-	-	02	01	-	-	-	EPE	50	20
FT314L	Food Process Engineering- II Laboratory	-	-	02	01	-	-	-	IOE	50	20
FT315L	Process Instrumentation, Dynamics and control Laboratory	-	-	02	01	-	-	-	IOE	50	20
FT316	Internship I Total	19	-	10	01 25	-	500	-	EOE -	50 300	20

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		ппетпе			чі апе		PAL /.U/./	- /

Audit Course III											
1 \$211	Introduction to Foreign			_	_	Institute	-	-	-	-	-
L3311	Language	02	-	_	_	Level					

\$ In theory student should appear for the CIE (Mid Semester Exam), submit the assignment and must secure 40% marks in SEE.

Total contact hours per week: 29+2=31and Total Credits=25

CIE: Continuous Internal Evaluation SEE: Semester End Examination IPE: Internal Practical Evaluation
 EPE: External Practical Examination IOE: Internal Oral Evaluation EOE: External Oral Examination
 Note: 1. Tutorials and Practical to be conducted in batches with batch strength not exceeding 15 students.

2. Internship I, an activity performed after Semester IV will be evaluated as the part of Semester V. It is mandatory for all the students to submit to the institute, the Internship Report duly certified by the concerned organization.



DEPARTMENT OF TECHNOLOGY, SHIVAJI UNIVERSITY KOLHAPUR <u>THIRD YEAR B.TECH</u>

Scheme of Teaching with Credits: Semester- V (Food Technology) To be implemented from Academic Year 2022- 23

		Те	Teaching Scheme with Credits (Hours / Week)						
Course Code	Course Title	L	т	Р	Credits				
FT311	Food Quality and Safety Management	04	-	-	04				
FT312	Fruits and Vegetables Processing Technology	04	-	-	04				
FT313	Dairy Technology	04	-	-	04				
FT314	Food Process Engineering-II	04	-	-	04				
FT315	Process Instrumentation, Dynamics and control	03	-	-	03				
FT311L	Food Quality & Safety Management Laboratory	-	-	02	01				
FT312L FT313L	Fruits& Vegetables Processing Technology Laboratory Dairy Technology Laboratory	-	-	02 02	01 01				
FT314L	Food Process Engineering-II Laboratory	-	-	02	01				
FT315L	Process Instrumentation, Dynamics and control Laboratory	-	-	02	01				
FT316	Internship I		-		01				
	Total	19	00	10	25				

Audit Course III

LS311 Introduction to Foreign Language	02	-	-	Nil
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Total contact hours per week: 29+2=31and Total Credits=25



DEPARTMENT OF TECHNOLOGY, SHIVAJI UNIVERSITY KOLHAPUR <u>THIRD YEAR B.TECH</u>

Scheme of Teaching and Examination: Semester- VI (Food Technology) **To be implemented from Academic Year 2022- 23**

Course	Course Title	T	Teaching Scheme with Credits (Hours / Week)			Examination Scheme (Marks)					
Code			I T D Cardita		Cradita	Theory				Practica	1
				creuits	Scheme	Max. marks	Min. Passing	Scheme	Max. marks	Min. Passing	
FT321	Sugar and Confectionery Technology	04	-	-	04	CIE SEE	30 70	40	-	-	-
FT322	Technology of Cereals and Bakery Products	04	-	-	04	CIE SEE	30 70	40	-	-	-
FT323	Design and Development of New Products	04	-	-	04	CIE	30 70	40	-	-	-
FT324	Process Equipment Design	03	-	-	03	CIE	30	40	-	-	-
FT325	Industrial Economics and Management	03	-	-	03	CIE	30 70	40	-	-	-
FT326	Food Laws and Regulations	02	-	-	02	-	-	-	IOE	50	20
FT321L	Sugar and Confectionery Technology Laboratory	-	-	02	01	-	-	-	EPE	50	20
FT322L	Technology of Cereals and Bakery Products Laboratory	-	-	02	01	-	-	-	EPE	50	20
FT323L	Design and Development of New Products Laboratory	-	-	02	01	-	-	-	IOE	50	20
FT324L	Process Equipment Design and Drawing Laboratory	-	-	02	01	-	-	-	IOE	50	20
FT325L	Mini Project	-	-	02	01				EOE	50	20
	Total	20	-	10	25	-	500	-	-	300	-

Audit Course IV											
RM321	Research Methodology	02	-	-	-	-	-	-	-	-	-

\$ In theory student should appear for the CIE (Mid Semester Exam), submit the assignment and must secure 40% marks in SEE.

Total contact hours per week: 30+2=32and Total Credits=25

CIE: Continuous Internal EvaluationSEE: Semester End ExaminationIPE: Internal Practical EvaluationEPE: External Practical ExaminationIOE: Internal Oral EvaluationEOE: External Oral Examination

Note: 1. Tutorials and Practical to be conducted in batches with batch strength not exceeding 15 students

2. There will be at least two industrial visits to reputed food industries (1-2 days) in the sixth week of the semester VI. The students will submit a report of the visits. This particular activity is equivalent to one Credit and it carries 50 marks as an Internal Oral Evaluation (IOE) which is included in Semester VI. For submission of the visit report, the students will follow one specific format.

3. Internship II which is part of Semester VII evaluation will be the activity after the SEE of semester VI. It is mandatory for all the students to undergo the same and report to the institute for the semester VII along with the completion certificate by the concerned organization. The students have to submit a hard as well as soft copy of the activity report to the institute.



DEPARTMENT OF TECHNOLOGY, SHIVAJI UNIVERSITY KOLHAPUR THIRD YEAR B.TECH

Scheme of Teaching with Credits: Semester- VI (Food Technology) **To be implemented from Academic Year 2022- 23**

		Т	eaching S (H	cheme with C ours / Week)	redits
Course Code	Course Title	L	Т	Р	Credits
FT321	Sugar and Confectionery Technology	04	-	-	04
FT322	Technology of Cereals and Bakery Products	04	-	-	04
FT323	Design and Development of New Products	04	-	-	04
FT324	Process Equipment Design and Drawing	03	-	-	03
FT325	Industrial Economics and Management	03	-	-	03
FT326	Food Laws and Regulations	02	-	-	02
FT321L	Sugar and Confectionery Technology Laboratory	-	02	02	01
FT322L	Technology of Cereals and Bakery Products Laboratory	-	02	02	01
FT323L	Design and Development of New Products Laboratory	-	02	02	01
FT324L	Process Equipment Design and Drawing Laboratory	-	02	02	01
FT325L	Mini Project	-	02	02	01
	Total	20	-	10	25

Audit Course IV

RM321	Research Methodology	02	-	-	-
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Total contact hours per week: 30+2=32and Total Credits=25

Sr. No.	Rules No.	Description
1	R.B.T. 1	Admission
2	R.B.T. 2	Award of Degree
3	R.B.T. 3	Attendance Rule
4	R.B.T. 4	Academic Progress Rules (ATKT Rules)
5	R.B.T. 5	Academic Flexibility
6	R.B.T. 6	Credit system
7	R.B.T. 7	Features of Credit System at Department of Technology, Shivaji
		University, Kolhapur
8	R.B.T. 8	Course credits assignment
9	R.B.T. 9	Detailed Evaluation Scheme
10	R.B.T. 10	Earning credits
10	R.B.T.11	CGPA Improvement Policy for award of degree
12	R.B.T. 12	Evaluation System
11	R.B.T. 13	Entry of Students from Regular Pattern to Credit Pattern
12	R.B.T. 14	Audit Courses
13	R.B.T. 15	Award of Grades for Re-Examination
14	R.B.T. 16	Showing & Supplying Photocopy of the Evaluated Semester End
		Examination Answer Paper, Re-Evaluation, And Period of Retention
15	R.B.T. 17	Change of Branch
16	R.B.T. 18	Disciplines and Conduct

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Glossary

B. Tech.: Bachelor of Technology, an Under Graduate Degree awarded from the Shivaji University, Kolhapur

Director: Director, Department of Technology, Shivaji University, Kolhapur

DC: Department Committee

DEC: Departmental Examination Coordinator

Semester: The academic year shall be divided into two regular semesters of approximately 20 weeks duration each. Typically the odd semester shall be from the first week of July to last week of November while the even semester shall be from the first week of January to the last week of May.

This shall include the period of academic delivery (14 to 15 weeks), Continuous Internal Evaluation (CIE) i.e. Mid Semester Examination and Assignments, Semester End Examination (SEE) assessment and declaration of results.

Course: Subject

Course Coordinator: Subject teacher

Course Credit: Weighted sum of the number of Lecture hours (L), Tutorial hours (T), and Practical hours (P) associated with the course.

Credits Earned: The sum of course credits for credit courses in which a student has passed.

Grade: Assessment of the student's performance in a course indicated by the letters, "AA", "AB", "BB", "BC", "CC", "CD", "DD", "FF", "XX", "ABSENT", "PP", "NP".

Grade Point: Number equivalent of the letter grades given by 10, 9, 8, 7, 6, 5, 4 corresponding to grades "AA", "AB", "BB", "BC", "CC", "CD", "DD" respectively. "FF" and "XX" carry zero grade points.

Instructor: Member of faculty who shall be assigned to teach a specific course.

Semester Grade Points: The sum of the products of credits and Grade Points for each course registered by a student in a semester.

SGPA: Semester Grade Point Average

CGPA: Cumulative Grade Point Average

ATKT: Allowed to Keep Terms.



Shivaji University, Kolhapur DEPARTMENT OF TECHNOLOGY

Four year B. Tech. Course Academic Rules and Regulations

R.B.T. 1 Admission:

Candidates are admitted to this course according to norms and conditions prescribed as per AICTE, DTE, and Maharashtra.

R.B.T. 2 Award of Degree:

Following rules prevail for the award of degree:

- **1.** B.Tech Degree shall be awarded to the student, who has registered and earned all the credits of prescribed courses under the general departmental requirements.
- 2. In addition to the credit requirement prescribed above for the Degree award, each student shall have to complete the requirements of Audit Course (AC) during the programmer. All the students shall receive certification as PP (*for Passed*), and NP (*for not passed*) in AC, in the Grade Card. While obtaining certification as PP is a mandatory requirement for the Degree award of a student, this shall not be taken into account for computing the final Cumulative Grade Point Average.
- **3.** A student has obtained CGPA \geq 4.5.
- 4. A student has paid all the institute dues and satisfied all the requirements prescribed.
- 5. A student has no case of indiscipline pending against him/her.
- **6.** University authorities shall recommend the award of B. Tech. Degree to a student who is declared to be eligible and qualified for above norms.

R.B.T. 3 Attendance Rule:

All students must attend every lecture, tutorial and practical class. However, to account for late registration, sickness or other such contingencies, the attendance requirement will be a minimum of 75% of the classes actually held. A student with less than 75% attendance in a course during the semester, in lectures, tutorials and laboratories taken together (as applicable), will be awarded an 'XX' grade in that course irrespective of his/her performance in the tests.

The course coordinator will award 'XX' grade to the student who is deficient in attendance taking into account the consolidated attendance record for the whole semester. For the purpose of attendance calculation, every scheduled practical class will count as one unit irrespective of the number of contact hours.

Attendance record will be maintained based upon roll calls (or any equivalent operation) in every scheduled lecture, tutorial and practical class. The course coordinator will maintain and consolidate attendance record for the course (lectures, tutorials and laboratories together, as applicable).

R.B.T. 4 Academic Progress Rules (ATKT Rules)

- 1. A student shall be allowed to register for the courses of the next year's odd semester only if he/she has earned all the credits of the previous year and has not failed in more than three passing heads (SEE, EPE/EOE) shall be considered for deciding the eligibility for ATKT.
- 2. For the promotion to the Third Year, studentshould not fail in more than three passing heads (SEE, EPE/EOE) of Second Year and all credits of First Year must be earned.
- **3.** For the promotion to the Final Year, studentshould not fail in more than three passing heads (SEE, EPE/EOE) of Third Year and all credits of Second Year must be earned.
- **4.** A student who has obtained 'FF' grade in SEE of a regular semester and has obtained 'FF' grade in 2nd attempt of SEE shall be eligible to choose one of the two options below to clear his/her backlog:
 - i. Re-registration for the next regular semester course whenever that course is offered.
 - ii. Application for Repeated Examination.
- **5.** A student who has detained in a regular semester and obtained 'XX' grade can Re-register for the next regular semester whenever it is offered.
- 6. The maximum duration for getting B. Tech. degree for students admitted in the first semester of U.G. program shall be 12 semesters (six academic years) while for lateral entry students admitted in the third semester shall be 10 semesters (five academic years) from their date of admission. The maximum duration of the program includes the period of withdrawal, absence and different kinds of leaves permissible to a student but excludes the period of rustication of a student from the Department. If a student is unable to gain all credits of first year in three years from the date of his/her admission, then he/she shall be declared as "Not Fit for Engineering" leading to discontinuation of his/her registration with the Department.
- 7. If a student is unable to gain all credits of first year in three years from the date of his/her admission, then he/she shall be declared as "Not Fit for Engineering" leading to discontinuation of his/her registration with the Department.

8. Depending upon the academic progress of a student, Department may take a decision regarding continuation or discontinuation of his/her registration with the institute.

R.B.T. 5 Academic Flexibility

- **1.** Flexibility in deciding Structure and Contents of Curriculum with reasonable frequency for changes in the same.
- **2.** Continuous Assessment of Students performance with newly adopted Credit System based on Award of Grade.
- **3.** Credits are quite simply a means of attaching relative values to courses different components. They are a currency of learning, and in general regarded as a measure of the time typically required to achieve a given curricular outcome.
- 4. All subjects (year-wise) under each course/discipline are unitized

R.B.T. 6 Credit system:

Education at the Institute is organized around the semester-based credit system of study. The prominent features of the credit system are a process of continuous evaluation of a student's performance/progress and flexibility to allow a student to progress at an optimum pace suited to his/her ability or convenience, subject to fulfilling minimum requirements for continuation.

A student's performance/progress is measured by the number of credits that he/she has earned, i.e. completed satisfactorily. Based on the course credits and grades obtained by the student, grade point average is calculated. A minimum grade point average is required to be maintained for satisfactory progress and continuation in the program. Also a minimum number of earned credits and a minimum grade point average should be acquired in order to qualify for the degree. All programs are defined by the total credit requirement and a pattern of credit distribution over courses of different categories.

R.B.T. 7 Features of Credit System at Department of Technology, Shivaji University, Kolhapur:

Every subject is allotted credits based on its academic importance/weightage.

- 1. All subjects may not have same credits.
- 2. 25 Credits / Semester.
- **3.** Absolute Grading System with 7 Passing Grades viz. AA, AB, BB, BC, CC, CD, DD and FF for failure.
- 4. Standardization of courses; each course is of 6 units.
- 5. Continuous Internal Evaluation (CIE) and Semester End Examination (SEE), both having (70:30) weightage in the student's performance in Course Work/Laboratory Work and other

activities. A student's performance in a subject shall be judged by taking into account the results of CIE and SEE together. Students must score 40% marks in SEE irrespective of the CIE marks.

(Note: The CIE shall be conducted as Mid Semester Exam and assignments throughout the semester on dates announced in advance by the department, and its results made known to the students from time to time. However, the dates for the SEE shall be fixed at the University level.)

- **6.** Continuous Internal Evaluation consists of Mid Semester Examination of 20 marks and assignment of 10 marks handled by Department of Technology and setting of question papers should be done by course coordinator. Assignments may be of varied nature for each course based on the need of the course coordinator.
- 7. Semester-End Examination (SEE), to be conducted by the Department of Technology, Setting of question papers should be done by course coordinator and jointly with an external examiner; this shall include a written examination for theory courses and practical/design/drawing examination with built-in oral part for laboratory/ design/drawing courses.
- **8.** Request for Mid Semester Examination for the students representing in co-curricular, extracurricular activities or on medical grounds will be considered only. On receipt of application from the student the DC will take decision for the conduct of the Mid Semester Examination.
- Care shall be taken to ensure that the total numbers of days for academic work are ≥180 per year.
- **10.** Academic schedule prescribed shall be strictly adhered to all the Branches.

R.B.T. 8 Course credits assignment:

Each course, except a few special courses, has a certain number of credits assigned to it depending upon its lecture, tutorial and laboratory contact hours in a week. This weight-age is also indicative of the academic expectation that includes in-class contact and self-study outside of class hours.

Lectures and Tutorials: One lecture or tutorial hour per week per semester is assigned one credit.

Practical/Laboratory: One laboratory hour per week per semester is assigned half credit.

Example: Course: Concrete Technology: 4 credits (3-0-2)

The credits indicated for this course are computed as follows:

3 hours/week lectures = 3 credits

0 hours/week tutorial = 0 credit

2 hours/week practical = $2 \times 0.5 = 1$ credit Also, (3-0-2) **4** credit course = (**3** h Lectures + **0** h Tutorial + **2** h Practical) per week = **5** contact hours per week

R.B.T. 9 Detailed Evaluation Scheme:

- Out of total 100% theory weightage, 30% weightage is allotted for Continuous Internal Evaluation (CIE). Appearing for CIE is must and student must submit the assignments to become eligible for Semester End Examination (SEE) of respective course.
 - CIE (30% weightage) includes:
 - a. Mid Semester Exam of 20 Marks of one Hour
 - b. Assignment of 10 Marks during entire semester
 - 2. For the Semester End Examination (SEE), 100 marks paper will be set and finally it will be converted to 70 marks, in which student must secure 40% (28 Marks out of 70) as university examination pass head and must appeared for CIE to become eligible for SEE of respective course.
 - **3.** Final theory marks (out of 100) will be the addition of CIE (30 Marks) and SEE (70Marks).
 - Final laboratory letter grade will be awarded (100%) will be the addition of CIE (50%) and SEE (50%).
 - Semester End Examination (SEE) for laboratory consists of External Practical Evaluation (EPE)/External Oral Examination (EOE). Continuous Internal Evaluation (CIE) for laboratory consists of Internal Practical Evaluation (IPE) / internal oral Evaluation (IOE).
 - **6.** There shall be no (SEE) for laboratory courses of First Year. The entire assessment of a student shall be based on CIE (IPE/IOE) 100% weightage and a minimum performance of 40% in CIE shall be required to get the passing grade. CIE of laboratory work consists of (IPE/IOE) shall be based on turn-by-turn supervision of the student's work and the quality of his/her work as prescribed through laboratory journals and his/her performance in oral or Practical/Oral examinations uniformly distributed throughout the semester. Student must submit and secure 40% marks in the IPE/IOE of the concerned course. Non submission of IPE/IOE will lead to term not grant (TNG).
 - **7.** The assessment of laboratory course from the 3rd semester onwards shall be carried out in two parts.
 - i. CIE of laboratory consists of IPE/IOE shall be based on turn-by-turn supervision of the student's work and the quality of his/her work as prescribed through laboratory journals and

his/her performance in oral or Practical/Oral examinations uniformly distributed throughout the semester. Student must submit and secure 40% marks in the IPE/IOE of the concerned course. Non submission of IPE/IOE will lead to term not grant (TNG).

- ii. SEE of laboratory shall be based on performing an experiment followed by an oral examination or a written examination.
- iii. The relative weightage for CIE and SEE for assessment of laboratory courses shall be 50% and 50% respectively from second year onwards and a minimum performance of 40% in both CIE and SEE separately shall be required to get the passing grade.
- iv. SEE for laboratory course shall normally be held one week before the SEE for theory courses and shall be conducted by a panel of examiners consisting of external and internal examiner. This activity shall be coordinated by Department Examination Coordinator (DEC) in consultation with Coordinator of the respective department.
- 7. A student failed in SEE of a laboratory course in a regular semester shall be eligible to appear for examination conducted along with SEE of laboratory courses of the subsequent semester. Such examination shall be fairly comprehensive (generally of 3 hours similar to EPE/EOE i.e. External Practical/Oral Examinations) to properly judge his/her practical skill and theoretical knowledge for that laboratory course. He/She shall suffer a grade penalty as per Table 3.
- 8. Assessment of Seminar, Mini-project, Major Project etc:
 - i. The Seminar/Project report must be submitted by the prescribed date usually two weeks before the end of academic session of the semester.
 - ii. It is desirable that the topics for seminar/project be assigned by the end of previous semester.
 - iii. The seminar report and the presentation of seminar shall be evaluated by panel of three departmental faculty members (decided by Branch Coordinator).
 - iv. The mini-project shall be evaluated jointly by a panel of three Internal Examiners.
 - v. The report on field training shall be evaluated by a panel of three Internal Examiners.
 - vi. The assessment of B. Tech major project work shall be carried out in two phases as shown below:

I-phase CIE (50% weightage) consists of

- a) Departmental Committee (Synopsis submission seminar)
- b) Project work assessment by Guide

(Departmental Committee consists of following:

Director- Chairman

Branch Coordinator from respective branch - member

Senior faculty from respective branch – member

Guide/Course Coordinator- member)

I-phase SEE (50% weightage) consists of Progress Seminar and presentation evaluated by Panel of Internal Examiners.

II-phase CIE (50% weightage) consists of

- a) Project work assessment by Guide
- b) Report submission seminar evaluated by Departmental Committee

II-phase SEE (50% weightage) (Final orals and presentations) evaluated by Panel of External and Internal Examiners.

- **9.** *Semester End Examination duration will be 4 hrs.
- **10.** In respect of CIE, and Laboratory work a target date shall be fixed for the completion of each sheet, job, Project, experiment or assignment and the same complete or incomplete shall be collected on the target date and assessed immediately at the respective departments by the concerned teachers and % marks (or grades) shall be submitted to the Co-coordinator. The Co-coordinator of the Department of Technology shall communicate this % of marks (or grades) to the University within a week after the end of each term.

R.B.T. 10 Earning credits:

At the end of every course, a letter grade is awarded in each course for which a student had registered. On obtaining a pass grade (\geq 40% minimum grade DD), the student accumulates the course credits as earned credits. A student's performance is measured by the number of credits that he/she has earned and by the weighted grade point average.

The credit system enables continuous evaluation of a student's performance, and allows the students to progress at an optimum pace suited to individual ability and convenience, subject to fulfilling minimum requirement for continuation.

R.B.T. 11 CGPA Improvement Policy for award of degree:

A student getting CGPA ≤ 4.50 with grade 'DD' in any course or grade'FF' in any course shall have the possibility to repeat one or more 'DD'graded courses along with the failed courses, /are being offered in a semester.

An opportunity shall be given to a student who has earned all the credits required by the respective program with CGPA greater than or equal to 4.00 but less than 4.50, to improve his/her grade by allowing him/her to appear for SEE of maximum two theory courses of seventh and eighth semester.

R.B.T. 12Evaluation System:

1 Semester Grade Point Average (SGPA)

$= \frac{\sum (Course credits in passed courses \times Earned Credits)}{\sum (Course credits in registered courses)}$

2. Cumulative Grade Point Average (CGPA)

$= \frac{\sum (Coursecredits in passed courses \times EarnedCredits) of all Semesters}{\sum (Course credits in registered courses)}$

- Cumulative Grade Point Average (CGPA) will be calculated cumulatively for Sem. I to Sem. VIII for regular students.
- Cumulative Grade Point Average (CGPA) will be calculated cumulatively for Sem. III to Sem. VIII for lateral entry students.
- 3. At the end of B. Tech Program, student will be placed in any one of the divisions as detailed below :

I st Division with distinction	: CGPA \geq 7.5 and above
I st Division	: CGPA <u>></u> 6.0 and <7.5
II nd Division	: CGPA \geq 5.5 and < 6.0

New gradation suggested as follows.

Table 1

Grade Points	Equivalent Range
5.5	55%
6.0	60%
6.5	65%
7.0	70%
7.5	75%

Conversion of CGPA to percentage marks for CGPA \geq 4.5 can be obtained using equation.

Percentage marks = (CGPA x 10)

An example of these calculations is given below:

Typical academic performance calculations - I semester

Course no.	Course credits	Grade awarded	Earned credits	Grade points	Points secured	
Col 1	Col 2	Col 3	Col 4	Col 4 Col 5		
					(col4 * col5)	
MALXXX	5	CC	5	6	30	
CSLXXX	4	CD	4	5	20	
PHLXXX	4	AA	4	10	40	
PHPXXX	2	BB	2	8	16	
MELXXX	4	FF	0	0	00	
TTNXXX	2	AB	2	9	18	
Total	21		17	38	124	

Table 2

- 1. Total Points earned for this semester = 124 Semester Grade Point Average (SGPA) = $\frac{124}{21}$ = 5.90
- Cumulative Grade Point Average (CGPA) =
 Cumulative points earned in all passed courses = 124 (past semesters) + 124 (this semester)

= 248

Cumulative earned credits = 23 (past semesters) + 21 (this sem.) = 44

Cumulative Grade Point Average (CGPA) = $\frac{\Sigma(124 + 124)}{\Sigma(23 + 21)}$ = 5.63 Table 3

System	٥f	Eval	luat	ion
system	UI	Lva	luai	1011

		Ma	Description of Performance				
Grade	Grade Points	Regular Semester Re-examination		Repeated Examination			
AA	10	90-100			Outstanding		
AB	09	80-89	90-100		Excellent		
BB	08	70-79	80-89	90-100	Very Good		
BC	07	60-69	70-79	80-89	Good		
CC	06	06 50-59 60-69		06 50-59 60-69		70-79	Fair
CD	05	45-49	50-59	60-69	Average		

DD	04	40-44	40-49	40-59	Poor
DD\$	04	Below 40	Below 40	Below 40	Poor (Subject to Application of Ordinance 96)
FF	00	Below 40	Below 40	Below 40	Fail
XX					Detained
ABSENT					Absent
PP					Passed (Audit Course)
NP					Not Passed (Audit Course)

Note: An equivalent certificate of CGPA to percentage of marks will be provided to student on his/her demand after remitting prescribed fees by Shivaji University.

R.B.T. 13 Entry of Students from Regular Pattern to Credit Pattern

A student of Department of Technology, Shivaji University, Kolhapur admitted before academic year 2020-21, and such student shall clear back log subjects of regular pattern if any, by appearing for respective examination conducted by Department of Technology. Further they shall undergo additional academic requirements (bridge course) if required as suggested by Department committee, so as to have turning with credit pattern.

R.B.T. 14 Audit Courses:

Additional courses shall be included as audit courses from the third semester onwards. While the performance of the student in audited courses shall be included in the Grade Card. These grades are not contributed to SGPA or CGPA of the concerned student.

R.B.T. 15 Awards of Grades for Re-Examination:

- A student who has obtained grade 'FF' in regular semester shall be eligible to appear for reexamination conducted before the commencement of the next regular semester.
- In such cases Continuous Internal Evaluation performance of a student shall not be wiped out.
- A student shall apply for re-examination before the last date of such application and shall appear for re-examination.
- 70% weightage similar to SEE shall be given to re-examination.
- A student who is eligible for re-examination, but remains absent for reexamination shall be given grade 'Absent'.
- A student shall be awarded a grade between 'AB' to 'DD', or 'FF' or 'XX' as given in Table 3 depending upon the cumulative marks obtained by him/her in CIE and Re-examination of SEE.

Here student has to suffer a grade penalty by accepting one grade lower as compared with the regular grades.

R.B.T. 16 Showing Evaluated Semester End Examination Answer Paper, Re-Evaluation, and applying for revaluation:

The evaluated answer book will be shown to the student as per the timetable prepared by the exam cell of DOT after the declaration of result. The grievances regarding the incorrect total and assessment of the not assed questions will be done by the respective faculty on submission of grievance form. A student having doubt regarding the grade declared in a course can apply for the photocopy of the answer book by remitting the prescribed fee as specified; a student can also apply for rechecking of his/her SEE answer book as per Shivaji University norms. There is no provision for showing of evaluated answer book, photocopy and rechecking for revaluation of the reexamination.

R.B.T. 17 Change of Branch:

Students shall be eligible to apply for Change of Branch after completing the first two semesters. The change of branch shall be permitted strictly on merit basis subject to the rules and regulations prescribed by Directorate of Technical Education, Maharashtra State/Admission Regulatory authority, Maharashtra State time to time.

R.B.T. 18 Disciplines and Conduct:

- i. Every student shall be required to observe discipline and decorous behavior both inside and outside the campus and not to indulge in any activity, which shall tend to bring down the prestige of the Department.
- Any act of indiscipline of a student reported to the Department, shall be referred as per Shivaji University norms.
- iii. If a student while studying in the institute is found indulging in anti-national activities contrary to the provisions of acts and laws enforced by Government he/she shall be liable to be expelled from the Department without any notice.
- iv. If a student is involved in any kind of ragging, the student shall be liable for strict action as per Maharashtra anti-ragging act 1999, which is in effect from 15th May 1999.
- v. If any statement/information supplied by the student in connection with his/her admission is found to be false/ incorrect at any time, his/ her admission shall be cancelled and he/she shall be expelled from the institute and fees paid shall be forfeited.
- vi. Student once admitted in the Department of Technology shall follow instructions issued from time to time.

- vii. If a student is found guilty of malpractice in examinations then he/she shall be punished as per the recommendations of the Shivaji University, Kolhapur.
- viii. Every admitted student shall be issued photo identification (ID) card which must be retained by the student while he/she is registered at Department of Technology. The student must have valid ID card with him/her while in the Department of Technology.
 - ix. Any student who alters or intentionally mutilates an ID card or who uses the ID card of another student or allows his/her ID card to be used by another student shall be subjected to disciplinary action.
 - x. The valid ID card must be presented for identification purpose as and when demanded by authorities. Any student refusing to provide an ID card shall be subjected to disciplinary action.

Note: All other rules and regulations will be applicable as per Shivaji University, Kolhapur.

Class, Part & Semester	:	Third Year B. Tech (Food Technology), V& VI					
Course Title	:	Food Quality and Safety Management			Course Code	:	FT311
Teaching Scheme (Hours)	:	Lecture Tutorial	re 04 Hours/Week ial 00 Hours/Week		Total Credits	:	04
Evaluation Scheme (Marks)	:	CIE=30 (20+10)	$\begin{array}{c c} 0 \\ 0) \end{array} SEE = 70 \\ = 100 \end{array} Grand Total \\ = 100 \end{array}$		Duration of SEE	:	3 Hrs
Revision	:	Fourth		Month	:	June 2022	
Pre-requisites (If any)	:	FT211, FT214, FT224, FT222 and FT311					
Course Domain	:	Core Prog	Core Program				

Course Rationale: Effective national food control systems are essential to protect the health and safety of domestic consumers. This course gives a conceptual introduction about food laws and regulations to protect public health, prevent fraud and deception, avoid food adulteration and facilitate trade. This course is important for better knowledge of National and international laws and regulations.

Сог	Irse Objectives: The Course Teacher will	Course Outcomes: Students will be able to		
1.	Explain the basic knowledge of food quality	1.	Understand the food quality aspects and	
	and Safety aspects		need of food safety	
2.	Study the quality assessment of Perishable	2.	Demonstrate the functional role and safety	
	and Non Perishable food material		issues of food contaminants, adulteration,	
			additives, packaging &labeling	
3.	Study the regulatory aspects in food	3.	Apply and analyze the quality assessment	
	processing industry		for nonperishable food products	
4.	Explain the various quality attributes of food	4.	Understand the various regulatory aspects	
			for food business operators	
5.	Describe the hygiene and sanitation in food	5.	Interpret the role, standard and law set by	
	processing industry		Indian and global regulatory authorities	
			with respect to food quality control	
6.	Study different certification system in Food	6.	Evaluate the hygiene and sanitation	
	processing industry		condition in food processing plant, equipment, storage and handling	

Curriculum Content	Hours				
Unit I: Introduction to food quality & Food safety management	08				
Food quality, its role in industry, Factors affecting quality control, Quality Attributes-					
Classification: Quality attributes, dominant attributes, hidden attributes					
Unit II:Methods of quality assessment of Perishable food material	08				
Sampling and specification of raw materials and finished products, Methods of quality					
assessment of food materials fruits, vegetables, dairy products, meat, poultry, egg and					
processed food products etc					
Unit III: Methods of quality assessment of Non Perishable food material	12				
Methods of quality assessment of food materials Cereals, Bakery and confectionery,					
Spices and plantation Crop					
Unit IV: Regulatory system in food processing					
Food laws and standards: FSSAI, Concept of Codex Alimentations/ /USFDA Food Safety					
Modernization Act (FSMA)/, BIS standards, BRC standards , International Food Standard					
(IFS)					
Unit V: Voluntary standards	08				
Food Safety management system: ISO 22000, HACCP, PRP and OPRP: GMP, GLP. GAP,					
GHP, GDP, Global Food Safety Initiative (GFSI) and Global-Gap.					
Unit VI:Sensory Evaluation	08				
Introduction -Panel Screening, Selection of Panel members, Requirements for					
conducting Sensory Evaluation and serving, Procedures, Methods of Sensory Evaluation,					
Instrumental analysis in quality control					

Suę	ggested Text Books:
1.	Amerine, M.A. Pangborn, R.M., and Rosseler, E.B. 1965.
2.	Principles of Sensory Evaluation of Food. Academic Press, New York. 2. Birk, G.G., Herman, J.G. and Parker, K.J. Ed1977.
3.	Sensory Properties of Foods. Applied Science, London. 3. Charalambous, G. and Inglett, G. 1981.
Suę	ggested Reference Books:
1.	The Quality of Foods and Beverages. (2 vol.set). Academic Press, New York. 4. Furia, T.E. Ed. 1980.
2.	Regulatory Status of Direct Food Additives. CRC Press, Florida. 5. Krammer, A. and Twigg, B.A. 1970.
3.	Quality Control for the Food Industry 3rd Edn. AVI, Westport. 6. Pattee, H.E. Ed. 1985.
4.	Evaluation of Quality of Fruits and Vegetables. AVI

Class, Part & Semester	:	Third Year B. Tech (Food Technology), V& VI					
Course Title	:	Fruits and Vegetables Processing technology			Course Code	:	FT312
Teaching Scheme		Lecture	04Hours/V	Veek	Total Credits	:	04
(Hours)	•	Tutorial	00 Hours/	Week	i otar or cuits		
Evaluation Scheme (Marks)	:	CIE=30	CIE=30 SEE = 70 Grand Total = 100		Duration of SEE	:	03 Hrs.
Revision	:	FourthMonth:June 2022					June 2022
Pre-requisites	:	Knowledge of Principles of Food Preservation, Food Chemistry,					
(If any)		Food Biochemistry, Food Additives and Contaminants, Food					
		Process Engineering I subjects etc.					
Course Domain	:	core	core				

Course Rationale:

The purpose of this course is to introduce and make aware the students about the preservation technologies of fruits and vegetables. To make them develop different processed products from fruits and vegetables and extend the shelf life of those.

Course Objectives: The Course Teacher will			<i>Course Outcomes:</i> Students will be able to			
1.	Demonstrate an understanding of the biochemistry and physiology of harvested fruits and vegetables	1.	Preserve the fruits and vegetables and make their products to make available them in off season.			
2.	Describe the basic steps involved in the production of processed fruits and vegetables	2.	Provide solution for spoilage of fruit and vegetables while handling and storage.			
3.	Describe the Principles and practices employed to maintain the quality of fruits and vegetables	3.	Learn storage of fruits and vegetables in perfect consumable condition for alonger time without change in its nutritional value			
4.	Gain a sound knowledge about the processing	4.	Extend the shelf life of the fruits and vegetable			

	and preservation technologies of fruits and vegetables		products with use of various protechniques.	eservation			
5.	Solve Indian farmers (Fruits and Vegetables) problems	5.	Prepare value added products from the vegetables so that farmers will get more i	fruits and ncome			
6.	Improve Indian agricultural economy	rove Indian agricultural economy 6. Learn to develop ability for value-ac formulation of products, and will learn to solve Agriculture and engineering problems.					
Curriculum Content He							
Uni	t I Introduction:			08			
Intro vege Veg	oduction to Fruits and Vegetables Current status etables. Post-harvest physiology, handling, l etables	of p osse	roduction and processing of fruits and s and conservation of Fruits and				
Uni Stru	t II Structure and Composition ctural, compositional and nutritional aspects of t	fruits	s and vegetables.	08			
Uni	t III Canning		<u> </u>	08			
Can	ning, Materials for canning, different machinerio	es in	cannery plant, defects in canning and				
plan	t layout of ideal canning unit. Aseptic packaging	5		10			
Uni Tecl	hnology of Jams Jellies marmalade Glazed fr	nits	Crystallized fruits fruits candy and	10			
fruit	preserve.	uno,	erystamzed mans, mans eandy, and				
Unit V Processing Technology of vegetables							
Ton	nato Products: sauces, ketchups, puree, pastes, c	hutn	eys and pickles, dehydrated fruits and				
vege	etables: powders			0.0			
Unit VI Technology of beverages Juices and pulps, RTS, concentrates squashes, cordials, nectars, carbonated beverages.							
Sua	aested Text Books.						
Jug	Tressler DK & & amn: Joslyn MA "Fruits and vagetables juice processing technology" edited by						
1.	AVIpublishing Co. Westport, Connecticut .197	71		undu oʻj			
2	Wills, Lee, Graham, Mc Glasson & amp; Hall	'Pos	t-Harvest Physiology & amp; Handling	of Fruits			
2.	^{2.} andVegetables. 1996						
Sug	gested Reference Books:						
1.	Girdharilal and Sidappa G.S. "Preservation of	fruit	s &vegetables", CAR. New Delhi.				
2.	Tressler D.K. & amp; Joslyn M.A. "Fruits & AVIpublishing Co. Westport, Connecticut 197	vege 1	etables juice processing technology" e	dited by			
3.	Wills, Lee, Graham, McGlasson & amp; Hall	"Po	st-Harvest Physiology & Handling of	Fruits &			
	Vegetables"AVI Publication						
4.	Shrivastava and Kunal. "Fruit and Vegetable Preservation"						

Cla	ss, Part & Semester	:	Third Year B. Tech (Food Technology), V& VI						
	Course Title	:	D	airy Teo	chnology		Course Code	:	FT- 313
	Teaching Scheme (Hours)	:	Lecture Tutorial	04Hour 00 Hou	rs/V rs/V	Veek Week	Total Credits	:	04
	Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 7	0	Grand Total =100	Duration of SEE	:	03 Hrs.
	Revision	:	Fourth				Month	:	June 2022
	Pre-requisites (If any)	:	Knowledge Biochemist	e of Foo try, Foo	d Pr d M	ocess Engg. I ai icrobiology	nd II, Food Chemis	stry,	Food
	Course Domain	:	Core						
Сот	urse Rationale: The cour	rse	is all about a	a scienc	e ai	nd engineering	field that deals w	ith t	he study
of	milk processing and its	pr	oducts. It is	s part c	of pi	rocessing indu	stry that involves	pro	ocessing,
pac	ckaging, distribution an	d t	ransportatio	on of v	ario	ous dairy prod	ucts such as mill	K, 1C	e-cream,
cne	ese, butter and various	in a o	uigenous pro			uding <i>dani, b</i> ut	termiik, gnee, cha	nna biol	, channa
Das	sed sweets, puneer, knot	u e	urao io to r	volves	scie	studenta with	doon undorston	dina	logy and
nut	rionta contributos to m		ntain haalth	v life a	nd	tochnology cor	t deep understand	ung toin	, or now
nut	and shalf life and impr		functions	y me a	nu	cecililology col	how to doal with	tam ⊧h n	quality,
ext	enu shen me anu mpi	000 :	e functions	or pack	agn	ing; and explain	and stave as valat	ui ii ad m	uu uon,
pro	cessing, quanty, packag	mg	, snen me, a	ISUIDUU	1011		and storage relat	ea p	
res	pectively. Dairy technol	ogy	/ Dasically us	ses rec		biogy to make	dairy products m	-teci	h as well
ası	userui.		- T l	•11	C	0.1	<u> </u>	- 1- 1	
LOI	urse Objectives: The Cou	urs	e Teacher w	111 ·	1	urse Outcomes	Students will be		2 to
1.	Clean milk production and	ecn I ha	inical proficie	sing of	1.	and milk produces	es involved in prod	uctio	n of milk
	milk Manufacture of wester	ern	and indigenou	sing of s dairy		and mink produc			
	products Testing and qual	lity	control of mi	ilk and					
-	milk products			1 6		<u> </u>	1 1 1 1 1 66		C '11
2.	Describe emphasis on	to	the princip	les of milk	2.	classify and ex	xplain the different	type	s of milk
	processing industry		used in the	ШПК		products			
3.	Illustrate the principal processing of milk and mil	les k pi	of handling	g and	3.	Identify purpose industry	e and functions of hy	gien	e in dairy
4.	Explain Engineering pri	ncij	ple and conce	epts to	4.	Analyze flow ch	nart for the production	n pr	ocesses of
	handle store and process of	f mi	ilk and milk pr	roducts		various milk pro	oducts		
5.	Categorize the role of	inf rol i	formation abo	out the	5.	Explain and Re	elate organization a	nd (operations
	importance of quality collu	101	in dan y muust	лу		that should be	taken when process	so pi sing	milk and
						dairy products			
			Curricu	lum Co	nter	nt			Hours

Un	it I Introduction	04		
Present status and future prospects of dairy industry,				
Un	it II Properties of milk	10		
Def	finition of milk, composition of milk from different species, colostrums, Nutritive			
val	ue of milk and milk products. Physico – Chemical properties of milk.			
Un	it III Processing of milk Collection, Processing	10		
Pas	steurization and sterilization of milk, Distribution of milk, Dairy equipments.			
Unit IV Milk Products				
But	tter and butter oil (Ghee), yoghurt and cheese: Classification, manufacturing process			
and	d quality controls, Ice-cream : Types of ice creams and manufacturing process			
Indigenous milk products Dahi, Khoa, Channa, Shrikhand, Paneer, Lassi, Butter milk,				
Rasgolla,Gulabjamun,pedha and burfi				
Unit V Condensation & Evaporation of milk				
Condensed milk, Kheer, Basundi,Rabri, Milk powder: Skim milk powder and whole milk				
pov	wder			
Unit VI Hygiene & Sanitation in Dairy Industry				
Hy	giene, Sanitation & cleaning in Dairy Industry			
Sug	ggested Text Books:			
Su ę 1.	ggested Text Books: Garret Smit. G., Dairy Processing. Woodhead Publishing Limited, England. 2005			
<i>Su</i> 1. 2.	ggested Text Books: Garret Smit. G., Dairy Processing. Woodhead Publishing Limited, England. 2005 Edger Spreer: Milk and Dairy Product Technology Marcel Dekkar Inc. New York, USA 2	005.		
<i>Su</i> 1. 2. 3.	ggested Text Books: Garret Smit. G., Dairy Processing. Woodhead Publishing Limited, England. 2005 Edger Spreer: Milk and Dairy Product Technology Marcel Dekkar Inc. New York, USA 2 James N. Warner "Principles of Dairy Processing" ,Wiley Eastern Ltd.	005.		

4.	Eckles, Combs and Macy "Milk and Milk Products", Tata McGraw Hill

Class, Part & Semester	:		Third Year B. Tech (Food Technology), V &VI						
Course Title	:	Food Process I			ineering-II	Course Code	:	FT-314	
Teaching Scheme (Hours)	:	Lecture Tutorial	04Hou 00 Hou	urs/Week ours/Week		Total Credits	:	04	
Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 7	70	Grand Total =100	Duration of SEE		03 Hrs.	
Revision	:	Fourth				Month	:	JUNE2022	
Pre-requisites : FT 221 (If any)							•		
Course Domain	:	Program	core						
Course Rationale:	Course Rationale:								
<i>Course Objectives:</i> The Course Teacher will				Course Outcomes: Students will be able to					
1. Explain the basic concept of food process engineering and food process operations				1.	Apply know techniques for	vledge for sele the food processing	ectir 1g o	g suitable peration	

2.	Describe the basic theory and concept	2.	Understand specific food processing	g operations				
	involved in food processing unit operations. used for various food products							
3.	Introduce students to food unit operation 3. Apply the general principles of food processing							
	applied in food process industries.							
			processing operations.					
4.	Demonstrate and explain different 4. Analyze the issues in the food processing							
	machines/equipment used in food processing		operations or equipment base	d on the				
			knowledge acquired					
5.	Make students able to design food	5.	Evaluate and solve the problem reg	arding food				
	processing and operating equipment for		processing operations					
	production of various food products.							
6.	Enable the students to solve problems in	6.	Design and develop food processing	operations/				
	food processing industries.		food processing equipment.					
	Curriculum Co	nte	nt	Hours				
Un	it: I Thermal processing			10				
Pri	nciples of Blanching, Pasteurization and St	erili	zation. Microbial survivor curves,					
the	rmal death time F, spoilage probability, method	s fo	r process calculations.					
Un	it II Evaporation			09				
Pri	nciples of evaporation, types and selection of	eva	porators, mass and energy balance.					
De	sign of single and multiple effect evaporators, a	ppli	cations in food industries.					
Un	it III Drying & psychometric chart	_		08				
The	e psychometric chart: construction and use	of	psychometric chart for food unit					
ope	erations. Drying: Principles of drying, dryin	ig r	ate kinetics, Dehydration systems,					
deh	hydration system design by mass and energy bal	ance	e, drying time prediction.					
Un	it IV Refrigeration and Freezing			09				
Rei	trigeration: Refrigeration system and its compo	onen	ts. Selection of a refrigerant. Cold–					
sto	rage plants Freezing: Food Freezing systems,	Fro	zen food properties, Calculation of					
free	ezing time by Plank's equation and other modifi	ed n	nethods	0.0				
	it v Crystallization			08				
Inc	eory and principles of Crystallization, nucl	leati	on, crystal growth, crystallization					
equ	inplications of crystallization in 1000 p	broce	essing	0.0				
	it vi Extrusion processes of Food	~_1d	and hat automian single server and	08				
Da	n serow extruder design extrusion cooking en		tion of extrusion					
twi	in screw extruder design, extrusion cooking, app	шса	tion of extrusion					
SUĘ		1 /		A 1 '				
1.	Press – Elsevier India Private Ltd. New Delhi,	200	lon to Food Engineering" 4th Edition 8	. Academic				
2.	Rao, D. G. (2012). Fundamental of Food Engin	neer	ing. PHI Learning Private Limited, Ne	ew Delhi.				
3.	Treybal, R. E. (1981). Mass Transfer Operatio	ns. 3	3 rd edition. McGraw Hill.					
4.	Geankoplis, C. J. (2002). Transport processe India	es ar	nd unit operations. 3rd Edition. Prent	tice Hall of				
Su	ggested Reference Books:							
1.	Coulson and Richardsons. (1998). Chemical Er	ngin	eering ,Vol I and II, Asiali Books Pvt	ltd.				
2.	2. Toledo, R. T. (1997). Fundamentals of Food Process Engineering (2 ed.): CBS Publications, New							

	Delhi.
3.	Earle, R.L, "Unit Operations in Food Processing". Pergamon Press, 2nd Edition, UK, 2003
4.	Warren,L McCabe, J.C. Smith and Peter Harriot,"Unit Operations of Chemical Engineering "
	McGraw Hill International Edition, Singapore, ISBN-007-424740-6, 2005
5.	Dennis, R.H. (1981). "Food Process Engineering. Academic Publishing and Press, King Saud
	University.

Cla	ss, Part & Semester	:	Third Year B. Tech (Food Technology), V & VI									
	Course Title	:	Process In	nstrumer and Co	ntat ontr	ion, Dynamics ol	Course Code	:	FT-315			
	Teaching Scheme (Hours)	:	Lecture Tutorial	03Hour 00 Hou	∙s/V rs/V	Veek Week	Total Credits	:	03			
	Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 7	0	Grand Total =100	Duration of SEE	:	03 Hrs.			
	Revision	:	Fourth				Month	:	June 2022			
	Pre-requisites (If any)	:	FT212, Kr	nowledge	e of	basic science						
	Course Domain	:	Core									
and sta to diff dev elu	andinstrumentation to process plants. Material and energy balances are used to model unsteady state(dynamic) process systems where control algorithms are required to bring the process back to equilibrium. Laplace Transforms are used as a means to conveniently solve ordinary differential equations, which are used when describing process control systems. Control loops are developed to represent industrial processes enabling appropriate control approaches to be alucidated											
Со	u rse Objectives: The Cou	ırs	e Teacher v	will	Со	urse Outcomes	: Students will be	able	e to			
1.	1. Discuss the fundamentals of process control.				1.	. Demonstrate fundamental understanding ofprocess control						
2.	Describe what the mathematic chemical processes is.	atic	al modeling	of	2.	Develop the mat	thematical model of sses.	vario	ous			
3.	Explain different control m application in controlling v	ode	es and their ous processes	s.	3.	Use the control in Knowledge in so	modes and apply this olving problems.	s				
4.	Categorize and differentiate	e th	e working of	f	4.	Choose the right	the working of 4. Choose the right type of controller for the gives					

	electric, hydraulic and pneumatic controllers.		process.			
5.	Demonstrate the working and application of different type of actuators and control valves.	5.	Identify the right type of final control ele the said purpose.	ement for		
	Curriculum Co	onter	ıt	Hours		
Un	it: I Measuring Instruments:	C .		07		
The	cory, practice and applications of measurements of supervision of prossure, vacuum, humidity and pL	of te	mperature, mass and levels.			
Un	astrement of pressure, vacuum, numbery and pr	1 111]	brocess maastry.	06		
Flo	w measuring devices for incompressible and con	npre	ssible fluids. Electro-hydraulic valves,	00		
hyd	raulic servomotors, electro-pneumatic valves. Pr	neum	natic actuators.			
Un	it: III Dynamic behavior of Chemical Processe	es:		08		
Cha	aracteristics of Chemical Process Control, Mathe	mati	cal Modelling of Chemical Processes,			
Lin	earization of non-linear systems, Solution of Lin	ear c	lifferential equation using Laplace			
Ira	nsform. First and higher order systems. Pure cap	acity	process, first order system with			
No	n-interacting systems. Dynamic behavior of seco	and a	order system: Under damped and over			
dan	ped and critically damped systems, Transportati	on	stater system. Onder damped and over			
Un	it: IV Introduction to feedback control:			06		
Ele	ments of Control loop - controller, measuring d	levic	e, final control element, transmission			
line	s, transducers, transmitters, development of	blo	ck diagram. Concept of servo and			
reg	trollers - on-off P PL PID Effects of proportion	oulau nali	ntegral and derivative actions			
con	uoners on on, 1, 11, 11, 11D. Encers of proportion	iai, i	negrar and derivative actions.			
Un	it VStability and Frequency response:			06		
Sta	bility analysis by Routh criteria, Root Locus Dia	agrai	m. Design of feedback control system			
using frequency response technique: Bode's stability criteria, gain and phase margin. Ziegler-						
Nic	hols tuning technique. Nyquist stability criteria.					
Un	it VI Other control strategies.			06		
Fee	d forward controller - design with steady state m	odel	design with dynamic model	00		
Coi	nbination of feed forward-feedback structure.	Case	cade control structure - analysis and			
des	ign, Ratio control, split range control, selective	e co	ntrol, override control, auctioneering			
con	trol.					
Sug	gested Text Books:					
1.	Stephanopoulos, G., Chemical Process Control: Hall, New Jersey, 1984.	An	Introduction to Theory and Practice, Pre	entice-		
2.	2. Johnson, C.D., Process Control Instrumentation Technology, Prentice Hall of India Private Limited(1992)					
Sug	ggested Reference Books:					
1.	Seborg, D.E. and Edgar, T., Process Dynamics a	and (Control, John Wiley and Sons (1989).			

2.	Coughanowr, D. R. and L. B. Koppel, Process systems Analysis and Control, Mc-Graw-Hill, 2nd. Ed.,
3.	Luyben, W. L., Process Modelling Simulation and Control for Chemical Engineers McGraw Hill, 1990.

Class Sem	s, Part & ester	:	Third Year B. Tech (Food Technology), V & VI							
	Course Title	:	Food Manag	Food Quality & Safet Management Laborato			Course Code	:	FT-311L	
Те	aching Scheme (Hours)	:	Practical	Hours/W	'eek		Total Credits	:	01	
Evaluation Scheme (Marks)			IOE = 50	EPE=Nil Grand Total = 50		Duration of IOE	:	NA		
	Revision	:	Fourth				Month	:	January 2022	
P	Pre-requisites	:	FT211, FT	214, FT22	24, FT2	22 a	ind FT311			
Co	ourse Domain	:	Core Prog	ram						
Course Rationale: This course will be able to provide the students hands-on experience of analysis. Students acquire knowledge of experimental data analysis, technical report writing a in teams.Course Objectives: The Course Teacher willCourse Outcomes: Students will be a 1.Elaborate the quality assessment of different Perishable and Non Perishable food material1.Understand the different hazards in fo system2.Study the regulatory aspects in food processing industry2.Understand the different quality attribute3.Elaborate the different types of Hazards3.Apply Food quality and management					erience of quality writing and work will be able to azards in food uality attributes for anagement system					
4.	Apply the HACCP	sys	tem in Food	chain		4	Understand the different and implementation for	nderstand the different training modules and implementation food products		
Study different training for different5certification system in the Food processing industry5						5	Understand and apply precautions as per the standard operating procedure			
Gene	<i>General Instructions:</i> Any 8 experiments to be performed from the list, any 2 experiments to be studied									
as de Sr. No.	Is demonstration. Sr. List of Experiments No.									
1.	Quality tests for ra	aw	materials of	different f	oods.					
2.	Sampling methods for different types of foods as per Codex, FSSAI, and Industry practice.									

3.	Adulteration in raw materials – FSSAI DART Book.
4.	Assessment of food label as per labeling and display regulations
5.	Quality testing of finished products for different foods.
6.	Determining Critical Control Point (CCP) for various foods.
7.	Prepare Hazard Analysis Critical Control Point (HACCP) Plan for different foods.
8.	Risk assessment for different foods.
9.	Traceability Plan for different foods.
10.	Regulatory compliance for different foods.
11.	Developing a Regulatory Compliant Food Label.
12.	Inspection of manufacturing facility as per FSSAI Schedule IV requirement.
13.	Inspection of catering facility as per FSSAI Schedule IV requirement.
14.	FOSTAC Training (QA/QC)
15.	Establishing Food Testing Lab as per Good Laboratory Practices (GLP) or minimum good practices for particular foods.
16.	Validate different claims on Food Labels as per FSS (Advertising and Claims) Regulations
Sugg	ested Text Books/ Reference Books/Manual
	Horwitz, W. (2010). Official methods of analysis of AOAC International. Volume I, agricultural
1.	chemicals, contaminants, drugs/edited by William Horwitz. Gaithersburg (Maryland): AOAC
	International, 1997
2.	Khandke, S. S., & amp; Mayes, T. (1998). HACCP implementation: a practical guide to the implementation of the HACCP plan Food control $9(2-3)$ 103-109
	$\frac{1}{2}$

Class, Part &	:	Third Year B. Tech (Food Technology), V &VI							
Semester									
Course Title	:	Fruits and Vegetables Processing Technology Laboratory			Course Code	:	FT312L		
Teaching Scheme (Hours)	:	Practical	2Hours/Week		Total Credits	:	01		
Evaluation Scheme (Marks)	:	IOE = 00	EPE=50	Grand Total = 50	Duration of EPE	:	2 Hrs		
Revision	:	Fourth			Month	:	June 2022		
Pre-requisites (If any)	:	Knowledge of Principles of Food Preservation, Food Chemistry, Food Biochemistry, Food Additives and Contaminants, Food Process Engineering I subjects etc.							
Course Domain	:	core							
Course Rationale:									

Cour	rse Objectives: The Course Teacher will	<i>Course Outcomes:</i> Students will be able to						
1.	Impart practical knowledge and skills	1.	Understand the processing offruits and vegetable products followed in foodIndustries.					
2.	Introduce students to fruits and vegetable processing technology	2.	Apply the machines/equipment used for the different unit operations in fruits and vegetable processing Industry.					
3.	Introduce students to different machines/equipment used in fruits and vegetables processing	3.	Develop practical proficiency in a fruits and vegetable processing units					
4.	Make the student to become acquainted with the principles of handling and processing food and agricultural products	4.	Identify, formulate, and solve agricultural and industrial problems.					
5.	Inculcate the practical proficiency in a fruits and vegetables processing laboratory	5	Students will be able to Problem evaluation and problem solving skills regarding fruits and vegetables processing operations that can affect the quality of products.					
Gene	eral Instructions: Any 8 experiments to be perform	ed f	rom the list, any 2 experiments to be studied					
asder	nonstration.							
Sr. No.	List of Experiments							
1.	Demonstration of canning of Fruits and Vegetable	es						
2.	Preparation of fruit jam							
3.	Preparation of fruit jelly							
4.	Preparation of fruit marmalade							
5.	Preparation of fruit preserve and candy							
6.	Preparation of fruit RTS/Syrups							
7.	Preparation of fruit squash							
8.	Preparation of cordial							
9.	Preparation of Nectar							
10.	Preparation of grape raisin							
Sugg	ested Text Books/ Reference Books/Manual							
1.	Institute's Laboratory Course Manual and equ follow etc.	ipm	ent wise Standard Operating Procedure to					

Class, Part & Semester	:	Third Year B. Tech (Food Technology), V & VI							
Course Title	:	Dairy T	echnology	Laboratory	Course Code	:	FT313L		
Teaching Scheme (Hours)	:	Lecture Tutorial	00Hours/V 01 Hours/V	Veek Week	Total Credits	:	01		
Evaluation Scheme (Marks)	:	IOE=00	EPE = 50	Grand Total =50	Duration of SEE	:	2 Hrs		

Revision	:	Fourth	Month	:	June 2022		
Pre-requisites (If any)	:	Knowledge of Food Process Engg. I and II, Food Chemistry and Food Microbiology					
Course Domain	:	Core					

Course Rationale: The course is all about learning the way we should evaluate sampling, analysis and standardization of milk. It helps to determine and understanding of micro and macro nutrients and their requirement for human body. It helps to understanding of processing of milk and various milk products. The course is all about learning of purpose and functions of hygiene in dairy industry

Со	urse Objectives: The Course Teacher will	Со	Course Outcomes: Students will be able to				
1.	Describe the knowledge of analytical skills	1.	Explain processes involved in production of				
	of milk and milk products		milk and milk products.				
2.	Elaborate students to starter culture	2.	Classify and explain the different types of milk				
	technology and selection of starters for		products				
	production of different dairy products.						
3.	Describe latest developments in milk	3.	Understand purpose and functions of hygiene				
	processing technologies		in dairy industry				
4.	Explain exposure of different equipments	4.	Produce and explain flow chart for the				
	used in dairy industry		production processes of various milk products				
5.	Determine and inculcate the practical	5.	Recognize organization and operations				
	proficiency in a Milk and milk processing		involved in milk processing and Precautions				
	laboratory. Also introduce the students to		that should be taken when processing milk and				
	latest developments in milk processing		dairy products.				
	technologies and new product development.						

Gene	eral Instructions:						
Sr. No.	List of Experiments						
1	Sampling and analysis of milk – physico-chemical properties and composition.						
2	DMC and DYC reduction tests, presence of adulterants and preservatives.						
3	Standardization of milk for markets.						
4	Clarification and separation of milk.						
5	Preparation of butter and ghee						
6	Ice-cream preparation						
7	Preparation of dahi, shrikhand, lassi etc.						
8	Preparation of khoa and khoa based sweets.						
9	Preparation of channa, paneer and chana based sweets.						
10	Visit to Dairy plant						
Sugg	Suggested Text Books/ Reference Books/Manual						
1.	Institute's Laboratory Course Manual and equipment wise Standard Operating Procedure to						

follow etc.

(Class, Part & Semester	:	Third Year B. Tech (Food Technology), V & VI								
	Course Title	:	Food Process Enginee Laboratory			g-II	Course Code	:	FT-314 L		
Тес	aching Scheme (Hours)	:	Practical	02 Hours	s/Week		Total Credits	:	01		
Eva	<i>Evaluation Scheme</i> (Marks) : IOE = 50 E0E=nil Gram 50		Grand Total =	50	Duration of IOE	:	NA				
	Revision	:	Fourth				Month	:	January 2022		
Р	re-requisites (If any)	:	FT 221L								
Са	ourse Domain	:	Program	core							
Cour expe	se Rationale: The rience in various fo	pu od	processing	is course is operation	s to prov s.	vide tl	he students hands-o	on			
Cour	se Objectives: The	e Co	ourse Teac	her will	С	ourse	Outcomes: Stude	nts	will be able to		
1.	Provide students ha relevant to the princ food processing ope	nd- ciple erati	on experiment es studied in ions theory.	nts the	1.	1. Perform experiments in relation to the food processing operations					
2.	Introduce students t machines/equipmen processing operatio	o d nt us ns	ifferent sed for food		2.	To ma dif	To know and apply the machines/equipment used for the different packaging materials				
3.	Inculcate the practic processing operatio	cal j ns	proficiency in	n a food	3.	3. Identify, formulate, and solve problems of operations or equipment					
Gene	eral Instructions:	An	y 8 experin	nents to be	e perfo	med	from the list.				
Sr. No.	List of Experiments										
1.	Designing based	d or	n Thermo b	acteriolog	y base	l on D) value				
2	Designing based	d or	n Thermo b	acteriolog	y base	l on z	value				
3	Designing based	d or	n Thermo b	acteriolog	y base	l on f	value				
4 5	Design of evapor	aco rat	or								
6	Determination	ofa	ir properti	es using n	svchom	etric	chart				
7	Study of drvers		properti		- ,						
8	Design of Drver	s									
8	Design of Dryers										

9	Leaching Experiment
10	Study of Freezing of foods by different methods
11	Study of refrigeration of foods
12	Study of Extrusion process in food
13	Study of crystallizer
14	Industrial Visit

Suggested Text Books/ Reference Books/Manual

1.	Barbosa-Cánovas, G.V., Ma, L., & Barletta, B. (1997). Food Engineering Laboratory Manual (1st
	ed.). CRC Press. https://doi.org/10.1201/9780203755662
2.	Kashaninejad, Mahdi & Daraei Garmakhany, Amir & M., Ahmadi. (2008). Experiment in Food
	Process Engineering,.
3.	Vieira, M. M. C., & Ho, P. (Eds.). (2008). Experiments in unit operations and processing of
	foods (Vol. 5). Springer Science & Business Media.

Class	, Part & Semester	:	: Third Year B. Tech (Food Technology), V & VI									
Cours	se Title	:	Process Instrumentation, Dynamics and Control Laboratory			Course Code		:	FT-315 L			
Teaci (Hou	hing Scheme urs)	:	Practical	02 Hours	s/Wee	ek		Total Credits	:	01		
Evalı (Mar	uation Scheme ks)	:	IOE = 50	E0E=nil Grand Total		otal	Duration of IOE	: NA				
Revis	ion	:	Fourth	ourth				Month	:	JUNE 2022		
Pre-requisites:FT221, FT314,												
(If an	y)											
Cours	se Domain	:	Core									
Cours	se Rationale: This c	oui	rse unit aim	s to provid	de stud	dents	s wit	h knowledge about	the	dynamic		
behav	vior of industrial pro	oce	sses, as wel	l as the ne	cessar	ry the	eore	tical and practical kr	10W	vledge to		
desig	n and operate proce	SS	control syst	tems.								
Cours	se Objectives: The C	ou	rse Teachei	· will		<i>Course Outcomes:</i> Students will be able to						
	Demonstrate the n	nat	hematical n	nodel		1.	Dev	velop mathematical	mo	dels of chemical		
1.	related to every pr	006	ess.	ss. a			and biological processes by writing					
						Uns	steady-state mass ar	id e	nergy balances.			
2 Classify the unit operations and explain the				è	2.	Rec	cognize unit operation	ons	and effect of other			
² effect of various parameters.						par	ameters on them.					
Describe the working of each instrument					3.	Evaluate instrumentation and control						
3.	and discuss the typ	bes	of controlle	ers that			rela	ated with the unit op	era	itions.		
	can be used.											

4	Compare the various processes that can be	4.	Identify unit operations used in different							
4.	controlled and their industrial application.		Industries.							
		•								
Gene	<i>General Instructions:</i> Any 8 experiments to be performed from the list, any 2 experiments to be studied as									
demo	onstration.									
Sr. No.	r. Io. List of Experiments									
1.	Dynamic behavior of first order system 1. Mercury Thermometer									
2	Dynamic behavior of first order system 2. Single	e tank	system							
3	Dynamic behavior of first order system 3. C.S.T.	R								
4	Dynamic behavior of first order system in series	5 1. Tv	vo tank non-interacting system							
5	Dynamic behavior of first order system in series	s 2. Tv	vo tank interacting system							
6	Dynamic behavior of second order system - Mer	cury	Manometer							
7	Dynamic behavior of final control Element - Pne	eumat	ic control valve. Study of Pneumatic controllers							
8	Proportional Controller									
9	Proportional Derivative Controller									
10	Proportional Integral Controller									
11.	Proportional Integral Derivative									
12.	Controller Control Systems - Study of closed loo	p con	trol system.							
	· · ·									
Sugg	Suggested Text Books/ Reference Books/Manual									
1	Institute's Laboratory Course Manual and equip	ment	wise Standard Operating Procedure to follow							
1.	etc.									

Class, Part & Semester	:		Third Year B. Tech (Food Technology), V &VI									
Course Title	:		Internship	o I	Course Code	:	FT316L					
Teaching Scheme (Hours)	:	Practical	02 Hours/Week		Total Credits	:	01					
Evaluation Scheme (Marks)	:	IOE = NIL	EOE=50	Grand Total = 50	Duration of EOE		05Hrs. for Entire class					
Revision	:	Fourth			Month	:	June 2022					
Pre-requisites (If any)	:	The pre-requisite for this course is to have the idea of the overview of the fundamental courses of Food Technology										
Course Domain	:	Core	Core									
<i>Course Rationale:</i> The course provides gist of exposure for the students for identification of												

Knowledge and skills essential to do well in a particular profession by hands on experience in industry for a month.

Course Objectives: The Course Teacher will			Course Outcomes: Students will be able to				
1.	Facilitate students to the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions;	1.	Acquaint to actual working environment.				
2.	Apply hands-on experience in the students related field so that they can relate and reinforce what has been taught at the university;	2.	Acquire ability to utilize technical resources				
3.	Promote cooperation and to develop synergetic collaboration between industry and the university in promoting a knowledgeable society;	3.	Write technical documents and give oral presentations related to the work completed.				
4.	Set the stage for future recruitment by potential employers;	4.	Develop attitude of a team player and aptitude for lifelong learning				

Class, Part & Semester	:	Third Year B. Tech (Food Technology), V & VI								
Course Title	:	Introductio	n '	Course Code	:	LS311				
Teaching Scheme (Hours)	:	2 hr. /week= 2	hr. /week= $2 \times 13 = 26$ hours							Nil
Evaluation Scheme (Marks)	:	Assignments Viva-voce	: :	50 25	Written Test Grand Total	:	25 100	Duration of SEE	:	Not Applicable
Revision	:	Fourth						Month	:	June 2022
Pre-requisites (If any)	:	No								
Course Domain	:	Language								

Course Rationale: This course provides a competitive edge for engineering graduates in their career choices. They will be able to communicate in a second language. The course enhances listening, reading skills and memory. Our graduates may be able to participate more effectively and responsibly in a multi-cultural world if they know another foreign language in addition to the English.

Course Assessment Methods: The students will be given five assignments each for 10 marks. At the end of the course, there will be a written test of 25 marks and a viva voce of 25 marks. There will be assessment for a total of 100 marks. Based on the marks obtained, they will be awarded with a grade similar to other credit courses. Though it is an audit course, obtaining passing grade is essential.

Course Objectives: The Course Teacher will *Course Outcomes:* Students will be able to

1	1Help students to understand basics and deepen their knowledge in a chosen foreign language.1Learn alphabets and acquire know grammar of the foreign language,								
2	Guide them to communicate and translate in the	2	and phrases therein.	n language					
2	chosen foreign languages.								
3	Help them describe, narrate, and ask/answer 3 Speak a little using the greetings, wel								
	questions in the foreign language in the present		in Foreign Language.						
	time about a variety of topics related to family,								
4	daily activities, eating, and traveling.								
4	ability to grasp the main idea and some	4	is your name surname tell age and	ns like, what					
	supporting details in short conversations		little communication in Foreign Langu	age.					
	(spontaneous or recorded) that pertain to the			8					
	topics mentioned above.								
5	Explain how to write sentences and short	5	Translate both verbally and write	tten, simple					
	paragraphs on familiar topics relating to personal		sentences in the foreign language.						
7	Narrate on how the foreign language functions	7	Achieve institute's mission with resp	ect to global					
	with awareness and understanding of the	/.	education and foreign language educati	ion.					
	language culture.								
	Curriculum Conte	ent		Hours					
Unit	: I: General Information on Basic Grammar of	the	foreign language, Introduction to	04					
alph	alphabets.								
Unit	Unit II: Gender of Noun, Number of Noun, Pronouns, Adjectives, Verbs and their usage 05								
in simple sentences, Numbers (up to 10), Simple Greetings in foreign language.									
Unit Who	: III: General Questions in foreign language, What is this? etc	, lik	te What is your name/surname?	04					
Unit	· IV: Simple parration about self/family/fri	enc	/University in foreign language	04					
chos	sen for studies. Practicing the learnt topics in	the	e class itself.	01					
Unit	V: Formation of simple sentences using Pa	rts	of Speech, Information on Cases,	05					
One	or Two simple lessons from any book.		1						
Unit	VI: Basic information on Country & Culture c	of la	nguage under study.	04					
	-		-						
Sug	zested Reference Books:								
1	V N Wagner and V G Ovsienko "Bussian	Lar	nguage" Russian People's Publish	ing House					
<u>.</u>	New Delhi.	201							
2.	S. Khavronina and A. Shirochenskaya, "Russi	ian	in Exercises", 1991.						
3.	"Genki – Japan Times".								
4.	Osamu & Nobuko Mizutani, "Aural Compreh	ens	sion in Japanese".						
5.	Osamu & Nobuko Mizutani, "An Introduction	1 to	Modern Japanese".						
6.	Y. Yoshida, "Japanese for Today".		71						
7.	Ed Swick. "The Everything Learning Gerr	nan	Book: Speak. Write and Unders	tand Basic					
	German in No Time".			20010					
	Ed Cruicle "Living Company"								
ð.	Eu Swick, Living German .								

9.	Eugene Jackson and Adolph Geiger, "German Made Simple: Learn to Speak and Understand German Quickly and Easily".
10.	Professor Martin Durrell, "Hammer's German Grammar and Usage" (Fifth Edition).

Class, Part & S	emester	: Third Year B. Tech (Food Technology), V & VI								
Course	Title	:	Suga	ar and Confe Technolo	ectionery gy	Course Code	:	FT-321		
Teaching S (Hour	cheme s)	:	Lecture Tutorial	04Hours/ NIL	Week	Total Credits	:	04		
Evaluation (Mark	Scheme s)	:	CIE=30 (20+10)	SEE = 70	Grand Total =100	Duration of SEE	••	03 Hrs.		
Revisi	on	:	Fourth			Month	:	June 2022		
Pre-requ (If any	Pre-requisites : FT214, FT211, FT221, FT222, FT314 and FT311 (If any) : : :									
Course Do	main	:	Program	Core						
<i>Course Rationale:</i> Confections refer to food items that are rich in sugar and carbohydrates. It includes a wide range of products such as chocolate confectionery i.e Dark chocolate and Sugar confectionery i.e Boiled Sweets, Toffees, Caramels, Chewing gums. Consumer habits, tastes, and preferences are constantly evolving. This has led to innovation in the field of confectionery. This course includes the processing of confectionery products, information about required ingredients, required small and large scale equipment. It also includes the required rules and regulations and quality management systems in the confectionerychocolate industry. Students will be expected to										
Course Objecti	<i>ves:</i> The Cou	ırs	e Teacher v	vill Co	ourse Outcomes	: Students will be	able	e to		
1. Study the aspects of a fundamenta	current mar confectionery ls of confectio	ket inc	t status and lustry along ry	l future 1. with the	Understand the current market status and future aspects of confectionery industry along with the fundamentals of confectionery					
2. Study the I sugars alon	Study the properties and processing of different sugars along with its applications				Explain the di processing of applications	Explain the different types of properties and processing of different sugars along with its applications				
3. Highlight ingredients machinery	he importanc and unde required in cor	erst nfe	and role of and the ctionery	various 3. different	Understand pu ingredients and confectionery	stand purpose and functions of various lients and the different machinery required in ctionery				
4. Understand confectione process	the differ ry products a	ent nd	t types of their manuf	Sugar 4.	Create and une products and the	derstand the sugar eir manufacturing pro	con	fectionery		

5.	5.Understand the different types of cocoa products and their manufacturing process5.Create and understand the cocoa products their manufacturing process							
6.	 Understand the quality management and development of new confectionery products Apply quality management system in Sugar and confectionary industry. Create new confectioner products. 							
	Curriculum Co	nte	nt	Hours				
Un	it I Introduction of sugar and Confectionary	7		06				
Present status and future scope of sugar and confectionery industries. Fundamentals of								
Unit II Natural Sugar & Sugar alcohol processing								
Processing of Invert sugar, Glucose syrup, High fructose corn syrup, Lactose powder, Maltose syrup, Honey Processing, Jaggery processing and its applications. Sugar alcohol								
IIn	it III Machinery and Additives in confection	erv	7	08				
Types of machinery in confectionery industry, Types of Additives, Its role and application in confectionery								
Un	it IV Cocoa and Chocolate processing			10				
Co	coa processing :cocoa bean processing, roastin	g, fe	ermentation, production of cocoa					
but	ter, cocoa powder		onching townshing moulding					
Chocolate processing: Ingredients, mixing, refining, conching, tempering, moulding,								
Linit V Sugar based confectionery processing								
Pro	cessing of High boiled sweets, Toffee, Fuc	lge,	Caramel, Lozenges, fondants and	10				
LIn	it VI Quality management and Innovation in		nfactionary Industry	08				
FSI	AS system in Confectionery industry, New pro-	duc	t development in Confectionery	00				
Suę	ggested Text Books:							
1.	Minifie, B.W. Chocolate, cocoa and confection 3 rd Edition, Aspen Publishers Inc., Great Brita	ery in. 2	- Science and Technology. 2010.					
2.	E.B. Jackson: Sugar Confectionery Manufact Great Britain	ure,	Second edition, Aspen publishers Ir	ıc.,1999.				
3.	3. Edwards, W. P. (2018). The science of sugar confectionery. Royal Society of Chemistry							
4. Lees, R. (2012). Sugar confectionery and chocolate manufacture. Springer Science & E Media.								
Suggested Reference Books:								
1.	Hartel, R. W., Joachim, H., &Hofberger, R. (2 85-124). Cham, Switzerland: Springer	018). Confectionery science and technol	ogy (pp.				
2.	 Mohos, F. Á. (2017). Confectionery and chocolate engineering: principles and applica John Wiley & Sons. 							

3.	W.Ray, Junk & Harry M. Pancost: Hand Book of Sugars - for Processors, Chemists and
	Technologists: AVI Publishing, West port (1973)
4.	Minifie, B. (2012). Chocolate, cocoa and confectionery: science and technology. Springer
	Science & Business Media.

Class, Part & Semester	:		Third Year B. Tech (Food Technology), V &VI							
Course Title	:	Technolo	ogy of Cereal Product	s and Bakery s	Course Code	:	FT322			
Teaching Scheme		Lecture	04Hours/Week Total Credits			:	04			
(Hours)	•	Tutorial	Nil		10tur or curts					
Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 70	Grand Total =100	Duration of SEE	:	03 Hrs.			
Revision	:	Fourth		Month	:	June 2022				
Pre-requisites	:	knowledg Food Mic	knowledge of Food Chemistry, Principles of Food Preservation, Food Microbiology and etc.							
Course Domain	:	Core								

*Course Rationale:*Cereal Processing industry and Bakery industry are most established food industries in India. The course will focus on making students understand the basics of cereals, get familiar with different cereals products, the nutritional value of cereals and the importance of cereals for Indian population. It hopes that by the end of this course students will have a complete knowledge about cereals and bakery products. The course is completely Industry oriented which includes all the knowledge that is expected in commercial industry.

Со	urse Objectives: The Course Teacher will	Course Outcomes: Students will be able to						
1.	Support students in understanding the present	1.	Understand the present status plus future prospects					
	status plus future prospects of cereals and their		of cereals and their importance.					
	importance.							
2.	Understand the morphology of wheat, their	2.	Understand the morphology of wheat, their					
	structure, their composition, and their milling		structure, their composition, and their milling					
	respectively.							
3.	Understand the morphology of rice, their structure,	3.	Understand the morphology of rice, their structure,					
	their composition, and their milling respectively.		their composition, and their milling respectively					
4.	Understand the morphology of corn, their types,	4.	Understand the morphology of corn, their types,					
	their milling and their products respectively.		their milling and their products respectively.					
5.	Learn the physicochemical properties and	5.	Describe the physicochemical properties and					
	processing of Barley, Sorghum and millets		processing of Barley, Sorghum and millets					
	respectively.		respectively.					
6.	Introduce students to the different bakery products.	6.	Describe the different bakery products.					
	Curriculum Content Hours							

Un	it l.Introduction	00					
Unit I: Introduction							
	rn Maizo Sorghum and Puo)						
Un	it II.Wheet	00					
Morphology Structure Composition Milling Products							
Init III. Dice							
	IL III:KICE	08					
Morphology, Structure, Composition, Milling, Parbolling, Products							
Un	IL IV:COFII	08					
IY	pes of Corn, wet mining and dry mining, Corn flakes, Starch, Corn syrup						
I I	t V. Darlan, Canahum and Millata Oat / Due	10					
	it v:Barley, Sorgnum and Millets – Oat / Rye	10					
Bai	riey Morphology, Physico-chemical properties, processing (Maiting)						
501	rgnum Morphology, Physico-chemical properties, sorgnum by products						
	liets – Oat / Rye, Importance of Millet, composition, processing of millet	10					
Un	It VI:Bakery Products	10					
Bre	ead, Biscuits, Cookies, Cake, Pastry (Role of ingredients, processing, major						
machineries and Quality control)							
Suggested list of Tutorials and Assignments:							
1)	Market Survey						
Su	ggested Text Books:						
1	Colin Wrigley, Ian Batey and Diane Miskelly. (2017). Cereal Grains: Assessing and M	lanaging					
1.	Quality. 2 nd Edition Elsevier Science and Technology						
2	D W Kent-Jones and Arthur James. (1967). Amos Modern cereal chemistry Londo	on, Food					
۷.	Trade						
3.	Matz Samuel (1999).Cereal Technology,Pan-Tech International						
Su	ggested Reference Books :						
1.	A. R. Daniel. (1967). Bakery Materials and Methods Paperback.4 th Edition. Elsevier	Science					
	Ltd; 4th edition						
2.	2. EIRI Board. (2010).Modern Bakery Technology & Fermented Cereal Products. BIOGREEN						
3.	Jan A. Delcour and R. Carl Hoseney (2009). Principles of Cereal Science and Tech	hnology.					
	Cereals & Grains Assn						
4.	Khetarpaul Neelam, Grewal Raj Bala and Sudesh Jood (2013). Bakery Science and	d Cereal					
	Technology. Daya Publishing House						
5.	Pomeranz Y. (1988). Wheat: Chemistry and Technology: 2. 3rd Edition. Amer Assn of	of Cereal					
	Chemists						

Class, Part & Semester	:	Third Year B. Tech (Food	Technology), V &	k VI	
Course Title	:	Design and Development of New Products	Course Code	:	FT-323

	Teaching Scheme	ching Scheme Lecture 04 Hour (Hours) Tutorial 00 Hour			rs/\	Week	Total Credits		04	
	(Hours)		Tutorial	00 Hou	rs/\	Neek				
	Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 7	70	Grand Total =100	Duration of SEE	:	03 Hrs.	
	Revision	:	Fourth				Month	:	June 2022	
	Pre-requisites	:	FT211, FT	214, FT	213	, FT222 and FT	221			
	Course Domain	:	Program (Core						
Co	urse Rationale: This cours	se i	s intended t	o familia	rize	students with th	ne product impleme	entat	ion stage	
off	ood product development	inc	luding preli	iminary p	orod	uct description,	prototype developi	nent	, product	
test	ting and the formal presen	tat	ion of a new	product	dev	elopment .Stude	ents will learn the i	mpc	ortance of	
tea	mwork, product specifica	tio	n, food forr	nulation,	foc	d ingredient tec	chnology, ingredie	nt in	teraction	
and	how to conduct and term	ina	te aproject i	in an ord	erly	manner.				
			<u> </u>	11	C	0 /		. 1 .		
Co	urse Objectives: The Course	rse	Teacher wi	1	C0	urse Outcomes:	Students will be a	ble t	0	
1.	Understand and gain exper	ien	ce in		1.	Describe the bas	sic fundamentals of			
	development	L				ivew product de	velopment			
2.	Gain knowledge in for	od	product in	gredient	2.	Apply the rela	tionship between t	heore	etical and	
	technology.					practical aspects	s of New product dev	ct development		
3.	Prepare a prototype for a ne	ew	food product	•	3.	Analyze the the New product de	eoretical and practi velopment	cal a	aspects of	
4.	Identify challenges involve a new food product and ho	ed in w to	n the develop o find solutio	oment of ons.	4.	Develop solution of new products	ns for the developme	ent		
5.	Understand techniques an the consumer product in de	d k vel	nowledge re opment.	elated to	5.	Explain the Development	importance of 1	New	Product	
6.	Develop critical thinking sl	kill	8		6.	Work Effectivel	y in terms to manage	e		
	related to food products.					new challenges				
			Curric	ulum Co	nter	nt			Hours	
Curriculum Coment Unit: I Design and Development of New Products Basic Fundamentals of Development of New Products, Need, importance, and objectives of formulation for new product development, The New Product Development Team								06		
Unit: II Formulation of New Product Ideas, business philosophy and strategy of new product, Formulation based onsources availability and cost competitiveness for concept developments of newproducts								10		
Un Ad Pro	it: III Technology for Ne aptable technology and su ocess development.	ew sta	Product inable techn	ology fo	r sta	ndardized form	ulation for		08	

Un	it: IV Scale up and Trials	10						
Process control parameters and scale-up, production trials for new product								
development at lab and pilot scale								
Un	it: V Quality Assessment	10						
Qu	ality assessment of newly developed products							
Un	it: VI Marketing, Economics of New Product, Commercialization and	08						
La	unching							
Ma	rket testing and marketing plan, Costing and economic evaluation ofdeveloped products,							
Co	mmercialization/product launch for marketing							
Su	ggested Text Books:							
1.	Fuller, G. W. (2004). New food product development: from concept tomarketplace. CRC Pr	ress.						
2	Aramouni, F., & amp; Deschenes, K. (2014). Methods for developing new foodproducts:							
۷.	" Instructional Guide. DEStech Publications, Inc.							
3	Earle, R., & amp; Anderson, A. (Eds.). (2001). Food product development: Maximizing success.							
5.	CRC press.							
Δ	Moskowitz, H. R., Saguy, I. S., & amp; Straus, T. (2009). An integrated approach ton	ew food						
1.	product development. CRC Press.							
Su	ggested Reference Books:							
1.	Saguy, I. S., & amp; Graf, E. (1990). Food product development: from concept to themar	ketplace.						
	Springer Science & amp; Business Media.							
2.	O'sullivan, M. (2016). A handbook for sensory and consumer-drive	en new						
	productdevelopment: innovative technologies for the food and beverage industry.W	oodhead						
	Publishing.							
3.	Beckley, J. H., Herzog, L. J., & amp; Foley, M. M. (Eds.). (2017). Accelerating newfood	l product						
design and development. John Wiley & amp; Sons.								
4.	Moskowitz, H. R., Porretta, S., & amp; Silcher, M. (2008). Concept research in foodproduc	ct design						
	and development. John Wiley & amp; Sons.							

Class, Part & Semester	:	Third Year B. Tech (Food Technology), V & VI						
Course Title	:	Process Equipment Design and Drawing			Course Code	:	FT-324	
Teaching Scheme		Lecture	ecture 03 Hours/Week Sutorial 02 Hours/Week		Total Credits	:	03	
(Hours)	•	Tutorial			Total Creats			
Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 70	Grand Total =100	Duration of SEE	:	03 Hrs.	
Revision	:	Fourth			Month	:	June 2022	
Pre-requisites (If any)	:	Fundamental statistics of the design of equipment safely and economically efficient manner.						
Course Domain	:	core	core					

*Course Rationale:*Chemical process plants include a number of important equipment such as reactors, distillation columns, absorbers, heat exchangers, evaporators, crystallizers, etc. Design of such equipment should be carried out a priory to set-up a process plant and thus, it is the basic step in a chemical process. The present course enables one to learn about the complete process design of Heat Exchanger, Condenser, Reboiler, Crystallizer, Evaporator, Packed column and Distillation column. Further, mechanical design of distillation column is also illustrated in this course

Co	urse Objectives: The Course Teacher will	Course Outcomes: Students will be able to			
1.	Elaborate the design procedures of process	1.	Act out role of design engineer in designing		
	equipment's used in chemical and food process		procedure and knowledge ofbasics of process		
	plants.		equipment design.		
2.	Describe the process and mechanical aspects of	2.	design of important components like flange,		
	equipment design.		coupling and belt drive		
3.	Explain various design codes and standards used	3.	Use and apply key criteria involved in the design		
	in design of equipment.		of internal pressure vessels as per ISCode		
4.	Illustrate the design of various process	4.	Design heat transfer equipments used in food		
	equipment's and mechanical components as per		processing.		
	calculateddesign				
5.	Summarize the process design, safety and	5.	Understand the relationship between process		
	environment.		design, safety and environment.		

Curriculum Content	Hours
Unit I Design Considerations and Keys	08
Design codes, Concept of Normal working pressure, Maximum working pressure, Design	
pressure, Normal working pressure, Max working temperature, Design Temperature, Design	
stress, Factors of safety, Selection of factor of safety, Design wall thickness, Internal and	
external Corrosion allowance ratio, Poisson ratio, Criteria of failure, Elastic stability.	
Materials of construction: Mechanical properties, Materials, Corrosion, Protective coating,	
Corrosion prevention, Choice of materials, Introduction, Types of keys, Strength of sunk key,	
Effect of key ways, Design of keys, Design of Heads: Introduction, Analysis and design of	
conical head, Flat cover head, Standard dished heads. Gaskets and Flanges: Introduction,	
Types of Gaskets and Flanges. Pipe joints: Standard pipe flanges for steam, Hydraulic pipe	
joints for high pressure, Design of circular flange pipe joints. Welded Joints, Riveted joints	
Unit II Storage vessels	06
Introduction, Criteria to decide the volume and dimensions of the vessel based on hold	
uprequirement, Design fixed conical roof cylindrical tank, Vessels with Flat cover top,	
Storage of gases in Spherical vessels Supports for vessels: Introduction, Bracket or Lug	
supports, Leg Supports, Skirt Supports , sliding supports (specially for heat exchangers)	
expansion of vessels and the need for flexible connections for the connected piping	
Unit III Design of Cylindrical Vessels under internal Pressure	06
Introduction, Thin wall vessels, Design Equations. Design of process vessels and pipes under	
external pressure: Introduction, Determination of safe pressure against elastic failure,	
Determination safe external pressure against plastic deformation, circumferential stiffness,	
Pipes and tubes under external pressure.	
Unit IV Process Design of Heat Exchanger	07
Introduction, Types of Heat Exchanger, Process Design of Shell and Tube Heat Exchanger.	
Concept of mean metal temperature and expansion in heat exchanger tube and shell,	

Introduction to types of Shell and Tube Exchangers based on Front Head, Shell and Rear End e.g. BEM, AEM, BEU, BFU etc. The types are defined as per TEMA. Plate heat exchanger and its type e.g. Gasketed, Semi-welded, Welded. Process Design of Evaporator: Introduction,								
Types of Evaporators, Methods of Feeding of Evaporators, Design of Evaporator								
Un Inte	Il V Process Design of Reaction Vessels	00						
	oduction, Materials of Construction, Agnation, Classification of Reaction Vessels,							
	utilizara Design of arustallizara Dropped Design of Detery Drugry Introduction, Types of							
	stanizers, Design of Potery Dryor							
Dry	ters, Design of Kolary Diver	06						
Un	It vi Design of Tall vessels and Design for Distillation Column and Agitator	00						
Intr	oduction, the Axial Stresses Due to Dead Loads, the Axial Stresses Due to Pressure,							
	igitudinal Bending Stresses due to Dynamic Loads, Design Of Distillation (Tail) column.							
Des	Sign of Sieve Tray for Distillation Column, Design of Thick Walled High Pressure Vessel,							
Des	sign of Bubble Cap Tray For Distillation Operation, Agitators : Introduction, Types Of							
Ag	itators, Baffling, Power Requirements, Design Of Turbine Agitator.							
Sug	ggested Text Books:							
1.	Joshi M. V., Mahajani V. V., 'Process Equipment Design', Macmillan, 2010.							
2	Bhattacharya B. C., 'Introduction to Chemical Equipment Design MechanicalAspects',							
2.	CBSPublishers, Delhi, 1991.							
2	E. Brownell and Edwin, H. Young, 'Process Equipment Design - Vessel Design ', John Wil	ey, New						
3.	York 1963.							
Sug	ggested Reference Books:							
1.	M. S. Peters & K. D. Timmerhaus, "Plant Design and economics for chemicalengineers." M	Ic Graw						
	Hill (2002).							
2.	Richard Turton, R.C. Bailie, W.B. Whiting, J.A. Shaeiwitz, "Analysis, Synthesis andD	esign of						
	Chemical Processes", Prentice Hall							
3.	R.K Sinnot," Coulson & Richardson's Chemical Engineering- Chemical EngineeringDesig	n", Vol.						
	6, Butterworth-Heinemann							
4.	Kalyanmoy Deb, "Optimization For Engineering Design-Algorithms and Examples", PHI I	Learning						
	Private Limited	U						
5.	S.S. Rao, "Engineering Optimization- Theory and Practice", New Age International							

Class, Part & Semester	:	Third Year B. Tech (Food Technology), V & VI						
Course Title	:	Indu	strial Econo Managem	omics and ent	Course Code	:	FT325	
Teaching Scheme (Hours)	:	Lecture Tutorial	03 Hours/ 00 Hours/	Week Week	Total Credits	:	03	
Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 70	Grand Total =100	Duration of SEE	:	03 Hrs.	
Revision	:	Fourth			Month	:	January 2022	

	Pre-requisites (If any)	:	Basic knowledge economics.	Basic knowledge of food processing industries, commerce, an economics.						
	Course Domain	:	Management	lanagement						
Cou man infla	rse Rationale: This course con agement. The course con tion, food processing inc	rse sist lus	provides basic kr the various concep tries, principles of	nowl ots re man	edge about the concepts of econon elated to economic problems, national agement, production, finance, and m	iics and income, arketing				
man	agement and its relevanc	e.								
Cour	se Objectives: The Course	Геа	cher will	Co	urse Outcomes: Students will be able to					
1	Make the students know basic knowledge about ma and recent trends in na economy.	th cro atio	e broad and sound -economic problems nal income of the	1	Assess the basic economic problems as trends of GDP in the economy.	as well				
2	Introduce the various of and its relevance in busin	con nes	cepts of inflation s decisions.	2	Examine the concepts relating to infla its effects on the economy in general food processing industry in particular	tion and and the				
3	3 Make the students be familiar with the structure of industrialization and economics of food industries				Evaluate the present status of the processing industry in India and its scope for expansion.	he food s further				
4	4 Get familiar with management principles and develop the entrepreneurial spirit & plan to start their own enterprise.				4 Apply management principles in the effective development and implementation of business activities.					
5	5 Make the students analyze production and 5 Carry out and e management techniques. 5 Carry out and e management technique processing industry.					oduction e food				
6.	6. Provide knowledge to understand finance, marketing, and sales management concepts for effective management of the business organization.									
			Curriculum Cor	nten	t	Hours				
Unit I Economic Problem & National Income Economic problem Law of demand, equilibrium between demand and supply, concepts of costs, cost curves and revenue curves of a firm, equilibrium of a firm under perfect competition, break-even analysis, break-even point.National income Concept of national income, estimation of national income, difficulties in measurement of national income,						08				
Unit	t II Inflation					06				
Meaning, types of inflation, causes, effects, control of inflation, value of money, index construction, utility, limitations, business cycles, phases of business cycles.										
Unit III Industrialization Industrialization: Need, Capital Requirement, Finance Cottage and small-scale industries: role, problems, and remedies. Present status of Food Processing Sector, Strategy & Initiatives to Promote Food Processing Sector in India.										

Unit	IV Principles of Management	07
Defi	nition, nature, levels of management, functions of management.	
i. Pla	anning: Nature, importance, types of plans, planning process, decision making.	
ii. 0	ganization: Principles of organization, organizational structure.	
iii. I	Directing: Theories of motivation, communication, process and barriers, leadership	
style	es.	
iv. C	ontrolling: Control techniques.	
Unit	z V Production Management	06
Sele	ction of site, plant layout, its type, functions of P.P.C. Materials management,	
pure	hase, inventory control, production and quality control.	
Unit	VI Finance Management & Marketing Management	06
Fina	nce management Scope and importance, capital structure planning, working capital	
man	agement, sources of funds, financial industries of India.	
Mar	keting management Marketing concepts, physical distribution, advertising and sales	
pror	notion, marketing research, sales management.	
Sug	gested Reference Books:	
1.	B.S.Bahl, Arun Bahl and G.D.Tuli, 'Essentials of Physical Chemistry', S.Chand and C	ompany,
	New Delhi(2005)	
2.	Gordon M. Barrow, 'Physical Chemistry', Sixth Edition, Tata McGraw Hill (1998)	
3.	Peter Atkins & Julio de Paula, Atkins' Physical Chemistry, 7th Edition, Oxford Univers (2002)	ity Press
4.	Cotton & Wilkinson, 'Inorganic Chemistry', Wiley Eastern Ltd-1986	
5.	mofpi_annual_report	
6.	D.N.Divedi, "Managerial Economics", Vikas New Delhi.	
7.	Dominick Salvatore, "Principles of Microeconomics", Oxoford University Press 5th edition	n.
8.	H.L. Ahuja, "Advanced Economic Theory", S. Chand Publication, New Delhi.	
9.	Koutsoyiannis, "Modern Microeconomics", Macmillan Press Ltd.	
10.	M.L. Jhingan, "Principles of Economics" (Hindi and English), Vikas, New Delhi.	
11.	M.L.Seth, "Principles of Economics" (Hindi and English), Laxmi Narayan, Agra.	
12.	H.L. Ahuja, "Economic Environment of Business - Macroeconomic Analysis", S	. Chand
	Publication, New Delhi.	
13.	H.L. Ahuja, "Macro Economics Theory and Policy", S. Chand Publication, New Delhi.	
14.	M.L. Jhingan, "Macro Economic Theory", Vrinda Publications (P) Ltd. Delhi.	
15.	MOFPI Annual Report	

Class, Part & Semester	:	Third Year B. Tech (Food Technology), V & VI					
Course Title	:	Food Law	s and Regulations	Course Code	:	FT326	
Teaching Scheme	:	Lecture	02 Hours/Week	Total Credits	:	02	

(H	(Hours) Tutorial 00 Hours/Week								
Evaluation Scheme (Marks)		:	EOE=NIL	IOE: 50		Grand Total =50	Duration of IOE	:	NA
Re	vision	:	Fourth				Month	:	JUNE 2022
Pre	e-requisites	:	FT211, FT	214, FT2	22, F	T224 and FT311	Ĺ	•	
(lf	any)								
Сот	urse Domain	:	Core prog	ram					
Con don pro is i	<i>Course Rationale:</i> Effective national food control systems are essential to protect the health and safety of domestic consumers. This course gives a conceptual introduction about food laws and regulations to protect public health, prevent fraud and deception, avoid food adulteration and facilitate trade. This course is important for better knowledge of National and international laws and regulations.								l safety of lations to his course
Cot	urse Objectives: The Cours	e T	'eacher will		Со	urse Outcomes:	Students will be abl	le to	
1	This course helps the s knowledge of food quality	stu 7 ar	dents to th nd Safety as	ne basic pects	1	Understand th of food safety	e food quality aspe	ects	and need
2	Introduce students to o different food products	qua	ality assessment of 2 Apply and analyses the quality assessment of perishable food products.					sment for	
3	Introduce students to aspects for food business	۷ op	various reį erators	gulatory	3	Apply and ana nonperishable	lyses the quality as food products	ssess	sment for
4	Introduce the sensory as food products	ses	ssment for a	lifferent	4	Understand the various regulatory aspects for food business operators			
5	Understand the different standards	nt	types of	national	5	Understand the food processin	e various voluntary g industries	star	dards for
6. Understand the different types of Inter- National standards					6.	Understand apply and analyses the sensory assessment for different food products			sensory
						•			
Cu	Curriculum Content						Hours		
Unit I Food laws in India0Introduction to food laws and standards, Erstwhile prevention of Food Adulteration Act and0Rules, Erstwhile Essential Commodities Act, Food Safety and Standard Act. 2006							04		
Un	Unit II Indian Food Regulatory Ecosystem								04
Lic	Licensing and registration Regulation, Food packaging, Labelling and Advertisement and Claims								

Regulations, Laboratory and Sampling Regulation, Food Product Standards Regulation, other important Regulations							
Unit III Consumer Awareness initiatives							
Fos	Fostac Training (Food Safety Supervisor), Fortification, BHOG, Eat Right India						
Мо	vement, Swasth Bharat Yatra, Eat right Campuses						
Un	it IV Other International Standard Setting Bodies:	04					
ISC	, OIE, IPPC, AOAC ASTM, EU and USFDA, GFSI, CODEX, BAM						
Un	it V Export and Import Laws and Regulations	04					
For	reign Trade Policy, Export (Quality Control and Inspection) Act, 1963,Promotion Bodies, Plant I Animal Quarantine, Customs Act and Import Control Regulations						
Un	it VI Other Laws and Standards Applicable to Foods	06					
Oth Age for	Other Laws Related to Food Products, Voluntary National Standards: BIS and AGMARK, National Agencies for Implementation of International Food Laws and Standards, Legal Metrology rules for Standard weights and measures as well as Packaged commodity rules						
Su	ggested Text Books:						
1	Rees, N., & Watson, D. (2000). International standards for food safety. Springer Science &	amp;					
1.	Business Media.						
2.	Fortin, N. D. (2016). Food regulation: law, science, policy, and practice. John Wiley & amp; Sons	S.					
	Singh, M., Iyer, U., & amp; Chandorkar, S. (2012). Nutrition labeling compliance of branded						
3.	Processed packaged foods with Indian food laws (FSSAI, 2011 regulations). Internafional						
	Journal of Food and Nutrifional Sciences, 2(4), 14-19.						
4 Motarjemi, Y., & amp; Lelieveld, H. (Eds.). (2013). Food safety management: a practical guide fo the food industry. Academic Press.							
Sug	ggested Reference Books:						
1.	Joint FAO/WHO Codex Alimentarius Commission, World Health Organization, & amp; Joint						
	FAO/WHO Food Standards Programme. (2007). Codex Alimentarius: Food import and						
	export inspection and certification systems. Food & amp; Agriculture Org						

 Mortimor, S., & Wallace, C. (2013). HACCP: A practical approach. Springer Science & Business Media.

(Class, Part & Semester	:	: Third Year B. Tech (Food Technology), V & VI						
	Course Title	:	Sugar and Confectione Technology				Course Code	:	FT-321L
Тес	aching Scheme (Hours)	:	Practical	2Hours/	Week		Total Credits	:	01
Eva	luation Scheme (Marks)	:	IPE = Nil	EPE=50 Grand =		0	Duration of EPE	:	02Hrs.
Revision			Fourth			Month	:	June 2022	
Pre-requisites:FT214, FT211, FT221, 1(If any)				21, FT22	22,	FT314 and FT311			
Са	ourse Domain	:	Program o	core					
<i>Cour</i> differ ingrea acqui	se Rationale: This rent sugar and ch dients, different typ re knowledge of ex	con loco bes apei	urse will be plate based of machiner imental data	able to pro products, ies, packag a analysis,	ovide the s acquire ging mate technical	stud ade rials repo	ents hands-on exper equate knowledge s used in confection ort writing and worl	rier of ery k in	ice in development various types of industry. Students teams.
Cours	e Objectives: The Co	ours	se Teacher w	ill	Co	urse	e Outcomes: Students	s wi	ill be able to
1. Elaborate the role of different additives in sugar and confectionery.				r and 1.	1. Understand the basic functions of different ingredients				
2. Study the different physicochemical properties sugar and confectionery products.			es of 2 .	Ap of	pply the hands-on exp different products	erie	ence on development		
3.	Understand the confectionery and c	wor hoc	king princi olate equipm	ples of s ent.	sugar 3.	Un typ	derstands the work bes of equipment	ing	principle different
	Understand the different types of sugar					An	alvsed the different c	mal	ity characteristics of

 4.
 Onderstand
 the different types
 of
 sugar
 4.
 Analysed the different quarty characteristics of sugar and confectionery products

 5.
 Understand the different types of chocolate-based products and their process.
 5.
 Understand and apply precautions as per the standard operating procedure

General Instructions: Any 8 experiments to be performed from the list, any 2 experiments to be studied as demonstration.

Sr. No.	List of Experiments
1.	Development of Invert Sugar by chemical method
2.	Effect of a Boiling point on the solubility of sugar
3.	Development of Jaggery based nutritious bar

4.	Development of Hard boiled candy
5.	Development of fruit-based Toffee
6.	Effect of conching on the preparation of Chocolate
7.	Preparation of medicated lozenges
8.	Effect of different emulsifier on chocolate quality
9.	Preparation of caramel
10.	Development Indian traditional sweet
11.	Visit to sugar based confectionary industry
Sugg	ested Text Books/ Reference Books/Manual
1	Institute's Laboratory Course Manual and equipment wise Standard Operating Procedure
1.	tofollow.
2	Potter, N. N., & Hotchkiss, J. H. (1995). Confectionery and chocolate products. In Food
4.	science (pp. 464-477). Springer, Boston, MA.

Class, Part &	:		Third Year B. Tech (Food Technology), V & VI								
Semester											
Course Title	:	Techno Bakery l	ology of Ce Products L	reals and aboratory	Course Code	:	FT-322L				
Teaching Scheme (Hours)	:	Practical	2Hours/	Week	Veek Total Credits		01				
Evaluation Scheme (Marks)	:	IPE = Nil	EPE=50	Grand Total = 50	Duration of EPE		02Hrs.				
Revision	:	Fourth			Month	:	June 2022				
Pre-requisites (If any)	:	knowledge of Food Chemistry, Principles of Food Preservation and Food Microbiology etc.									
Course Domain	:	core	core								
Course Rationale: This course has wide applications in careal processing and hakery industry											

Course Rationale: This course has wide applications in cereal processing and bakery industry. The course is completely Industry oriented which includes all the practical techniques that are expected in commercial industry. Hence the student will be well versed with basic and advanced technique which is need of the hour for providing employment opportunities in the cereal processing industry and bakery industry.

Cour	rse Objectives: The Course Teacher will	Со	urse Outco	mes: Students w	vill be able	e to
1	Determine physicochemical properties of wheat and	1.	Determine	physicochemical	properties	s of
1.	wheat flour.		wheat and w	vheat flour.		
2	Familiarize themselves with good manufacturing	2.	Familiarize	themselves	with	good
Ζ.	practices and standard operating procedures used in		manufacturi	ing practices and sta	andard oper	rating

	laboratory activities.		procedures used in lab exercises.									
3.	Prepare bread and biscuits.	3.	Prepare bread and biscuits.									
4.	Guide the students to prepare cake.	4.	Prepare cake.									
5.	Evaluate the sensory characteristics of bakery products.	5	Evaluate the sensory characteristics of bakery products.									
6.	Introduce the utensils and equipment used in bakery.	6.	Describe the utensils and equipment used in bakery.									
Gene	General Instructions:											
Sr. No.	List of Ex	peri	ments									
1.	Physico-chemical properties grains											
2.	Physico-chemical properties flours											
3.	Determination of gluten content											
4.	Determination of moisture content of cereal grain	s an	d cereal flours									
5.	Introduction to utensils and equipments used in bakery											
6.	Preparation of bread											
7.	Preparation of biscuit											
8.	Preparation of cookies											
9.	Preparation of cake											
10.	Evaluation of Sensory Characteristics of Bakery I	Prod	ucts									
11.	Visit to Bakery Industry											
12.	Visit to Rice Mill											
Sugg	ested Text Books/ Reference Books/Manual											
1	Zhou. W., Hui, Y. H. (2014). Bakery Products	s Sc	ience and Technology, 2nd Edition, Wiley									
1.	Blackwell Publishers.											
2.	Pyler, E. J. and Gorton, L.A. (2009). Baking S land Publications.	cien	ce and Technology. Vol.1 4 th Edition, SOS									
3.	Tanley, P.C. and Linda, S. Y. (2008). Baked Pr	rodu	cts: Science Technology and Practice. John									
	Wiley & Sons Publishers.	1										
4.	A. K. Daniel. (1967). Bakery Materials and Meth 4th edition	ods	Paperback.4" Edition. Elsevier Science Ltd;									
5	Khetarpaul Neelam, Grewal Raj Bala and Suc	lesh	Jood (2013). Bakery Science and Cereal									
э.	Technology. Daya Publishing House											

Class, Part & Semester	:	Third Year B. Tech (Food Technology), V & VI						
Course Title	:	Design and Development of New Products Laboratory	Course Code	:	FT-323L			

Те	aching Scheme	:	Practical	02 Hours	/Week		Total Credits		01
Eva	Evaluation Scheme (Marks)		IOE =50	EOE=nil	Grand Total =	50	Duration of IOE	:	50
	Revision	:	Fourth		I		Month	:	JUNE 2022
P	re-requisites (If anv)	:	FT211, FT	`214, FT21	3, FT22	2 an	nd FT221		
Ca	ourse Domain	:	Program	Core					
<i>Cour</i> imple proto deve form a pro	<i>Course Rationale:</i> This course is intended to familiarize students with the product implementation stage of food product development including preliminary product description, prototype development, product testing and the formal presentation of a new product development. Students will learn the importance of teamwork, product specification, food formulation, food ingredient technology, ingredient interaction and how to conduct and terminate a project in an orderly manner.								
<i>Lour</i> 1.	Course Objectives: The Course Teacher will Course Outcomes: Students will be able Elaborate the role of market survey and 1. Understand the market survey I. fundamentals of New products. 1. Understand the market survey development development						est survey and tet survey and tor new to product		
2.	Demonstrate and formulating a new p	I prod	Explain the luct	e method	of 2.	Ar de	oply the hands-or velopment of product	n e Es	experience to the
3.	Elaborate the legal layout, machinery products	l re rec	quirements, quired for c	designing p leveloping	new 3.	Ur pla ne	nderstands the legal ant layout, machinery w products	requ req	uirements, designing uired for developing
4.	Explain the different product	nt q	uality charac	cteristics of	new 4.	Ar ne	nalyzed the different w product	qual	ity characteristics of
5.	Discuss the preca	auti e	ons as per	the stan	dard 5.	Ap pro	oply precautions as peocedure	er th	e standard operating
<i>Gene</i> studi Sr. No.	e ral Instructions: ed as demonstrati	An on.	y 8 experir	nents to b <i>List c</i>	e perfor of Exper	meo ime	d from the list, any nts	y 20	experiments to be
1.	Market Survey of	se	lected new	food prod	uct				
2.	Preparation of pu	urc	hase report	for a selec	cted raw	' ma	terial and packagi	ngı	naterial
3.	Draw the feasible	e pl	ant layout f	for a select	ed new	pro	duct	ct	
4. 5.	Study and write t	he	legal requi	rements fo	or the sa	a se me s	selected new produ	uct	
6.	Prepare a propos	al •	scale un an	d cost estin	nation of	of se	lected new produc	t	
7.	Physicochemical	ass	sessment of	selected r	new pro	duct		•	
8.	Sensorial assess	ner	t of selecte	d new pro	duct		-		
9.	Microbial assessment of selected new product								

10.	Visit to any food industry
Sugg	ested Text Books/ Reference Books/Manual
1	Institute's Laboratory Course Manual and equipment wise Standard Operating Procedure to
1.	follow.
	Horwitz, W. (2010). Official methods of analysis of AOAC International. Volume I,
2.	agricultural chemicals, contaminants, drugs/edited by William Horwitz. Gaithersburg
	(Maryland): AOAC International, 1997.

(Class, Part &	:	Third Year B. Tech (Food Technology), V & VI									
	<i>Course Title</i> : Process Equipment Des and Drawing Laborato			sign ory		Course Code	:	FT-324L				
Те	Teaching Scheme (Hours):Practical2 Hours/Week			k		Total Credits	:	01				
Evaluation Scheme (Marks)		:	IOE =50	EPE=00	Grand Total = 50		Grand Total = 50		0	Duration of IOE	:	
	Revision : Fourth							Month	:	JUNE 2022		
P	Pre-requisites (If any)	:	It is impor and basic	rtant to ha idea of eq	ve a g uipm	good ent d	kno Irav	owledge of design vings	eq	uipment safely		
С	Course Domain : core											
Cour	rse Rationale:											
Cour	rse Objectives: The	e Co	ourse Teacl	ner will		Cou	Course Outcomes: Students will be able to					
1.	Explain general d process design deve	esig elop	gn considera ment	tions invol	ving	1.	State the basic concepts of process design development and general design considerations					
2.	Describe basic con process, involving e	cep equi	ts of econor pment cost, a	nic analysis and profitab	s for ility	2.	Perform economic analysis for process to calculate equipment cost, and profitability for process					
3.	Illustrate design pa procedures for press	aran sure	neters, know vessels.	ledge of de	esign	3.	Des pres	sign internal pressur	re v	vessels and external		
4.	Discuss of shell & t	ube	heat exchan	ger Design.		4.	Des	sign of shell & tube h	neat	exchanger		
5.	5. Demonstrate procedures in designing of tray distillation columns including minimum reflux ratio, number of stages, feed stage, and column diameter.				tray eflux umn	5.	Des	ign of sieve tray dis	tilla	tion column		
Gene studi	General Instructions: Any 8 experiments to be performed from the list, any 2 experiments to be studied as demonstration											
Sr.		,,,,,		List o	of Exp	perin	nen	nts				

No.										
1.	Standard equipment symbols , Standard instrumentation symbols									
2.	Pipe fittings , flanges and gaskets, Heads and closures									
3.	Keys and couplings									
4.	Riveted and Welded joints									
5.	Pressure relief devices									
6.	Design and drawing supports for vessels-Bracket Support									
7.	Design and drawing Leg Support, Skirt Support									
8.	Design and drawing of packed absorption tower									
9.	Design of heat exchangers.									
10.	Design of tall vertical vessels									
11.	Design of reaction vessel.									
12.	Design of evaporator.									
13.	Design of agitation system									
Sugg	gested Text Books/ Reference Books/Manual									
1.	Institute's Laboratory Course Manual and equipment wise Standard Operating Procedure to follow.									

	Class, Part & Semester	:		Third year B. Tech (Food Technology), V & VI						
	Course Title	:	Mini Projec			;		Course Code	:	FT325L
Teaching Scheme (Hours)			Lecture= Nil	Practical = 2hr/Week/Batch x13=26		ch	Total Credits	:	01	
Evaluation Scheme (Marks)		:	IOE=00	EOE = 50	Grar	nd To =50	otal	Duration of Exam (in case of External Examination)	:	05 hours for entire class
	Revision	:	Fourth					Month	:	June 2022
Pre-requisites (If any):Pre-requisites include familiarity of Food T				nclude od Te	e bas chno	ic kno ology	owledge of soft sk field overview.	ills,	presentation and	
С	ourse Domain	:	Research	Skills						
<i>Cour</i> based entire	<i>se</i> Assessment M d on External Oral e semester, project	eth Ev re	rods: Stude valuation a port submi	ents'e t the e ssion a	valua end of at the	tion f the end	is by sem of ser	v continuous inter ester, based on a nester.	nal tter	l examination and ndance during the
Cour	se Objectives: The	Со	urse Teach	er will		<i>Course Outcomes:</i> Students will be able to				
1.	Plan for various ac distribute the work a	ctivi amo	ities of the point	project embers;	and	1.	Deve form	elop the ability to concluse it	choo	ose the problem and
2.	Promote self-study independent research	y, h at	critical this oility;	nking	and	2.	App their	ly their fundamental competency for solv	kno ve ei	owledge according to ngineering problems
3. Make the students initiate their own small conceptual or practical based projects individually or as a team of no more than 4 members:				mall jects an 4	3.	Deve	elop their leadership	qua	lity.	
4. Make them use Research Methodology for the task undertaken;				the	4.	Achi	ieve the project's goa	ls		
5. Trial exercise that may help them to satisfactorily complete their major project in the final yea				to et in	5.					
	• • • •									

Curriculum content

The students either individually or in a group of maximum 4 members will undertake a mini project on a particular topic under the guidance of an internal course teacher. Prior to the topic selection, the course in charge will guide them about searching topic. The work progress will be monitored from time to time in batch wise review conducted during the semester. A 25 to 30-pages report is to be written upon completion of the activity. The report should include academic contents such as the background, objectives, product/process description, the work done, conclusion and market survey. The Department will provide a specific format for report writing. The assessment of the mini project work will be based

on: 1. Attendance 2. Physical Demonstration of their work 3. Seminar delivery based on the work carried out and 4. Mini Project reports submitted.

Cla Sei	ss, Part & mester	:	Third Year B. Tech (Food Technology), V & VI									
	Course Title	:	Research Methodology				Course Code	:	RM321			
1	Feaching Scheme (Hours)	:	2 hr. /week= 2 x 13= 26 hours				Total Credits	:	Nil			
E	valuation Scheme (Marks)	:	Assignments Viva-voce	: :	50 25	Wr Tes Gra Tot	ritten st and tal	:	25 100	Duration of SEE	:	NA
	Revision : Fourth						Month	:	June 2022			
	Pre-requisites : No											
	Course Domain	:	Research Skills									
 in conducting any research and reporting its findings. The course helps in the search of literature, development of research questions and the creation of the most suitable study design. In a way research methodology is the constitution for research. <i>Course Assessment Methods:</i> The students will be given five assignments each for 10 marks. At the end of the course, there will be a written test of 25 marks and a viva voce of 25 marks. There will be assessment for a total of 100 marks. Based on the marks obtained, they will be awarded with a grade similar to other credit courses. Though it is an audit course, obtaining passing grade is essential 												
<i>Course Objectives:</i> The Course Teacher will <i>Course Outcomes:</i> Students will be able to					ole to							
1.	Introduce research phenomenon and its key components to the students;				1.	Understand some basic concepts of research and its methodologies;						
2.	Discuss the role and importance of research in the engineering sciences;				2.	Explain key research concepts and issues;						
3.	3. Identify and discuss the complex issues inherent in 3. Read in the appropriate research design, and implementing a research project;				Read, comprehend, and explain research articles in their academic discipline;							
4.	. Help identify various sources of information for literature review and data collection:				4.	. Select and define appropriate research problem and parameters						
5.	Identify and discuss the sampling, data collection	e co	oncepts and procedures of 5. Follow research procedures of sampling, data collection, analysis and finally reporting or research work;				pling, data porting of					

	Curriculum Content	Hours			
Unit I: Introduction to Research: Objectives of Research, Types of Research, Research					
Methods and Methodology, Concept of Hypothesis, Literature survey and Documentation.					
Unit II: Methods of Data Collection and Analysis: Classification of data, Collection of					
Primary and Secondary Data, Selection of appropriate method, Data Processing					
Operations, Elements o	f Analysis, Statistics in Research, Descriptive Statistics,				
Statistical data, Variable,	Measures of Dispersion, Measures of Skewness, Regression				
Analysis, Correlation					
Unit III: Research Des	gn : Need for Research Design, Features of Good Design,	05			
Different Research Designs, Basic Principles of Experimental Designs, Sampling Design,					
Steps in Sampling Design,	Types of Sampling Design, Sampling Fundamentals, Estimation,				
Sample size Determination,	Random sampling				
Unit IV: Testing of Hypot	theses and Analysis of Variance:	06			
Types of hypothesis (experimental and non-experimental). hypothesis testing				
(parametric and non-para	ametric tests), types of errors and their control, Chi-Square				
test, Analysis of Variance	(ANOVA), One way and Two way ANOVA, Use of statistical				
software's in data analysis	software's in data analysis (SPSS, Graph Pad Prism).				
Unit V: Interpretation and	nd Report Writing:	06			
Meaning of Interpretatio	n, Technique of Interpretation, Precaution in Interpretation,				
Significance of Report V	Vriting, Different Steps in Writing Report, Layout of the				
Research Report, Types of Reports, Oral Presentation, Mechanics of Writing a Research					
Report, Precautions for Writing Research Report.					
Suggested Reference Books:					
1. Kothari, C.R., Researc	h Methodology –Methods and techniques, New Age Publicati	ons, New			
Delhi, 2009.					
2. Montgomery, Douglas	Montgomery, Douglas C. (2007), 5/e, Design and Analysis of Experiments, Wiley India.				
3. Montgomery, Douglas C. & Runger, George C. (2007), 3/e, Applied Statistics & Probability for					
Engineers, Wiley India	l.				
4 I Modhi Statistics Mot	hads Now Ago Publications Now Dolhi 2009				
	J. Meuni, stausucs Meunous, New Age Publications, New Deim 2009.				
5. Nabendu Pal and Sah Pvt. Ltd. New Delhi, 20	Nabendu Pal and Saheb Sarkar, Statistics: Concepts and Applications, Prentice Hall of India Pvt. Ltd. New Delhi, 2004.				
6. Panneerselvam, R., Research Methodology, Prentice-Hall of India, New Delhi, 2004					

Equivalence of Third Year B.Tech (Food Technology) Semester V and VI

The above detailed syllabus is a revised version of the Third Year B.Tech (Food Technology) Program being conducted by Shivaji University at its Technology Department. This syllabus is to be implemented from June 2022, (Academic year 2022-23). Prime feature of this revision is the transformation of existing curriculum into the concept of Outcome Based Education as specified in NBA rules and regulations. The Equivalence for the subjects/courses of Food Technology at Third Year B Tech Semester V and VI pre-revised Program under the faculty of Engineering and Technology is as follows. Third Year B.Tech Semester V (Food Technology)

Sr.	Third Year B.Tech(Food	Third Year B.Tech(Food	Remark		
No	Technology) Semester V	Technology) Semester V			
	Pre-revised syllabus	Revised syllabus			
1	Food Packaging	Food Quality and Safety Management	Interchange in subjects of Final Year and TY for better alignment due to introduction of new subject in TY, as per the		
			suggestions of PAB committee		
2.	Fruits and Vegetables Processing Technology	Fruits and Vegetables Processing Technology	Slight modification in content		
3	Dairy Technology	Dairy Technology	Slight modification in content		
4	Food Process Engineering-II	Food Process Engineering-II	Slight modification in content		
5	Process Instrumentation, Dynamics and control	Process Instrumentation, Dynamics and control	Slight modification in content		
6	Food Packaging Laboratory	Food Quality & Safety Management Laboratory	Interchange in subjects of Final Year and T Y for better alignment due to introduction of new subject in T Y, as per the suggestions of syllabus and PAB committee		
7	Fruits& Vegetables Processing Technology Laboratory	Fruits& Vegetables Processing Technology Laboratory	Slight modification in content		
8	Dairy Technology Laboratory	Dairy Technology Laboratory	Slight modification in content		
9	Food Process Engineering-II Laboratory	Food Process Engineering-II Laboratory	Slight modification in content		
10	Process Instrumentation, Dynamics and control Laboratory	Process Instrumentation, Dynamics and control Laboratory	Slight modification in content		

Third Year B.Tech Semester V (Food Technology)

11	Internship I	Internship I	Slight modification in content
12	Introduction to Foreign Language	Introduction to Foreign Language	Slight modification in content

Third Year B.Tech Semester VI (Food Technology)

Sr.	Third Year B.Tech (Food	Third Year B.Tech (Food	Remark		
No	Technology) Semester VI	Technology) Semester VI			
	Pre-revised syllabus	Revised syllabus			
1	Sugar and Confectionery	Sugar and confectionery	Slight modification in		
	Technology	technology	content		
_	Testaslass of Constast	Teshashasa f Cenerale en l			
2.	Technology of Cereals and	Technology of Cereals and	Slight modification in		
	Bakery Products	Bakery Products	content		
3	Biochemical Engineering	Design and Development of	Interchange in subjects of		
5	Diochemical Englicering	New Products	Final Vear and T V for		
		new rioducts	hatter alignment due to		
			intro du stien of a sur		
			Introduction of new		
			subject in 1 Y, as per the		
			suggestions of syllabus and		
			PAB committee		
4	Process Equipment Design and	Process Equipment Design	Slight modification in		
-	Drawing	and Drawing	content		
	Diawing		content		
5	Industrial Economics and	Industrial Economics and	Slight modification in		
	Management	Management	content		
7	Sugar and Confectionery	Sugar and Confectionery	Slight modification in		
	Technology Laboratory	Technology Laboratory	content		
0	Technology of Cereals and	Technology of Cereals and	Slight modification in		
0	Bakery Products Laboratory	Bakery Products Laboratory	content		
	Dakery Froducts Laboratory	Dakery Froducts Laboratory	content		
9	Biochemical Engineering	Design and Development of	Slight modification in		
	Laboratory	New Products Laboratory	content		
	-				
10	Process Equipment Design and	Process Equipment Design	Slight modification in		
	Drawing Laboratory	and Drawing Laboratory	content		
		M: : D : /			
11	Mini Project	Mini Project	Slight modification in		
			content		
12	Research Methodology	Research Methodology	Slight modification in		
12	Research Methodology	Research Meulouology	content		
			CONTENT		