
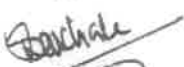






DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY
MINUTES OF MEETING

Date : 26.07.2022

A meeting of Ad-hoc Board in Chemical Technology under the Faculty of Science & Technology was held on 26.07.2022 at 11.30 am in the Department of Chemical Technology, University Campus, Aurangabad.

The following members were present :-

Sr.N	Name	Sign	Sr.No.	Name	Sign
0.					
1.	Professor Dr. Pravin Wakte (Chairman)			Special Invitees:-	
2.	Dr. B.K. Sakhale		6.	Shri. V.D. Rathod,	
3.	Dr. Sachin Bhusari,		7.	Shri. G.R. Pandhare,	ABSENT
4.	Dr. U.S. Annapure,		8.	Dr. A.P. Sarkate,	
5.	Dr. Prafull Sable,	ABSENT			

The following points were discussed in the meeting.

- 1] To revised courses of First Year of B.Tech.(Chemical) Pharmaceutical & Fine Chemical Technology and B.Tech.(Chemical) Food Technology.

The members of A Board of studies in Chemical Technology unanimously approved the revision of first year B.Tech. (Chemical) Pharmaceutical & Fine Chemical & Food Technology from the academic year 2022-23 as per OBE guidelines.

It was discussed & proposed by the committee that as per NEP & mandatory inclusion by AICTE, subject like "Universal Human Values" be incorporated for the first year B.Tech. programs of Food & Pharmaceutical & Fine Chemical.

- 2] Introduction of New Post Graduation Degree courses.
The members of A Board of studies in Chemical Technology unanimously approved introduction of following two, new post graduation degree programs with detailed scheme of Teaching - Evaluation, Rules - Regulation / Guidelines & intake from the academic year 2022-23.
i) M.Sc. - Food Technology ii) M.Sc. - Drug & Intermediate Technology
- 3] Introduction of New Post Graduation Diploma courses
The members of A Board of studies in Chemical Technology unanimously approved introduction of following two, new post graduate diploma programs with detailed scheme of Teaching - Evaluation, Rules - Regulation / Guidelines & intake from the academic year 2022-23.
i) PG Diploma in Cosmetic Technology ii) PG Diploma in Food Safety & Quality
- 4] Any Other Item with the permission to the Chair.

The meeting concluded with vote of thanks By Chairman, Faculty of Science and Technology.


Chairman

Ad-hoc Board in Chemical Technology

Enclosed :- Details of all courses / programs

शैक्षणिक विभाग (संलग्न)
दिनांक ०१-०८-२०२२

सादर,

सादर करण्यात येते की, रसायन तंत्रज्ञान विषयाच्या तदर्थ मंडळाने दिनांक २६ जूलै, २०२२ रोजी घेतलेल्या निर्णयानुसार सदरील विभागामध्ये एम.एस्सी. फुड टेक्नॉलॉजी, एम.एस्सी. ड्रग इंटरमेडीएट टेक्नॉलॉजी, पीजी डिप्लोमा इन कॉसमेटिक टेक्नॉलॉजी व पीजी डिप्लोमा इन फुड सेफ्टी अॅण्ड क्वालिटी अभ्यासक्रम शैक्षणिक वर्ष २०२२-२०२३ पासून सुरु करणेबाबत तदर्थ मंडळाचे अध्यक्ष डॉ. प्रविण वक्ते यांनी सादर केलेला प्रस्ताव अवलोकनार्थ सादर.

प्रस्तुत प्रकरणी सविस्तर असे सादर करण्यात येते की, विद्यापीठ विभागामध्ये नवीन विभाग किंवा नवीन विषय सुरु करण्यासाठी महाराष्ट्र सार्वजनिक विद्यापीठ अधिनियम २०१६ कलम ३१ (घ) नुसार व्यवस्थापन परिषदेस विद्यापरिषदेने म.सा.वि.अ. २०१६ कलम ३१ (१) (च) अन्वये केलेल्या शिफारशीवरून व्यवस्थापन परिषदेने सदरील अभ्यासक्रमांना मान्यता दिल्यानंतर अभ्यासक्रम सुरु करणेबाबत नियमात तरतूद करण्यात आलेली आहे किंवा दोन्ही प्राधिकरणाच्यावतीने मा. कुलगुरु महोदयांनी उक्त प्रकरणी कार्यवाही केल्यास नवीन अभ्यासक्रम, विभाग किंवा विषय सुरु करण्यास हरकत नाही, अशी सदरील नियमात तरतूद आहे.

प्रस्तुत प्रकरणी रसायन तंत्रज्ञान तदर्थ मंडळाचे अध्यक्ष तथा रसायन तंत्रज्ञान विभागाचे विभाग प्रमुख डॉ. प्रविण वक्ते यांनी सादर केलेल्या प्रस्तावानुसार सर्व संबंधित अभ्यासक्रमाच्या संदर्भात खालीलप्रमाणे सविस्तर तपशिल सादर करण्यात येत आहे.

अ.क्र.	प्रस्तावित अभ्यासक्रमाचे नाव	अभ्यासक्रमाचा कालावधी	प्रस्तावित निर्धारित प्रवेश क्षमता	प्रस्तावित शैक्षणिक शुल्क प्रति विद्यार्थी प्रति वर्ष	अभ्यासक्रमाचे माध्यम	प्रवेश पात्रता	शैक्षणिक शुल्कापोटी जमा होणारे वार्षिक महसूल	प्रस्तावित अभ्यासक्रम सुरु करण्यासाठी विद्यापीठास येणारा अंदाजे वार्षिक खर्च	शेरा
१.	एम.एस्सी. फुड टेक्नॉलॉजी	०२ वर्ष (०४ सत्र)	२०	रु. २०,०००/-	इंग्रजी	बी.ई. / बी.टेक. रसायन अभियांत्रिकी / बायो-टेक्नॉलॉजी, बी.व्होक., बी.टेक. (अॅग्री. अभियांत्रिकी), बी.टेक. (फुड सायन्स अॅण्ड टेक्नॉलॉजी), बी.ई. (मेकॅनिकल अभियांत्रिकी), बी.एस्सी. अॅग्रीकल्चरल, हॉर्टीकल्चरल, डेरी सायन्स अॅण्ड टेक्नॉलॉजी, बी.ई./ बी.टेक. (फुड प्रोसेसिंग टेक्नॉलॉजी), बी.एस्सी. (फुड अॅण्ड न्यूट्रीशन), बी.एस्सी. (फुड सायन्स अॅण्ड क्वालिटी कंट्रोल) इत्यादी.	रु. ४,००,०००/-	रु. २,४०,०००/-	
२.	एम.एस्सी. ड्रग इंटरमेडीएट टेक्नॉलॉजी	०२ वर्ष (०४ सत्र)	२०	रु. ४०,०००/-	इंग्रजी	बी.एस्सी. (रसायनशास्त्र), बी.फार्मसी. व बी.टेक. / बी.ई. इन फार्मास्युटीकल अॅण्ड फार्मि केमिकल / केमिकल	रु. ८,००,०००/-	४,८०,०००/-	

						अभियांत्रिकी (किमान ५५% गुणासह उत्तीर्ण)			
३.	पीजी डिप्लोमा इन कॉसमेटिक टेक्नॉलॉजी	०१ वर्ष (०२ सत्र)	२०	रु. २०,०००/-	इंग्रजी	एम.टेक. (फार्मा) / एम.टेक (ऑईल) / एम.टेक (परफुमरी)/ एम.टेक. (फुड)/ एम.एस्सी. ऑरगॅनिक केमिस्ट्री/ बी.टेक. (कॉसमेटिक टेक्नॉलॉजी)/ बी.टेक. (फार्मा)/ बी.टेक. (ऑईल) / बी.टेक. (फुड)/ बी.फार्मा. / बी.टेक. (केम)/ बी.एस्सी. इन लाईफ सायन्स अॅण्ड इक्विवॅलंट कोर्स इन ऑदर प्रॅज्युरेशन	रु. ४,००,०००/-	रु. २,४०,०००/-	
४.	पीजी डिप्लोमा इन फुड सेफ्टी अॅण्ड क्वालिटी	०१ वर्ष (०२ सत्र)	२०	रु. २०,०००/-	इंग्रजी	एम.एस्सी. फुड सायन्स अॅण्ड न्यूट्रीशन / फुड सायन्स अॅण्ड टेक्नॉलॉजी / बायोटेक्नॉलॉजी / बायोकेमिस्ट्री / मायक्रोबायोलॉजी/ अॅग्रीकल्चरल / हॉर्टिकल्चरल / पोस्ट हारवेस्ट टेक्नॉलॉजी ऑर एम.टेक. इन फुड टेक्नॉलॉजी /फुड प्रोसेसिंग टेक्नॉलॉजी / फुड बायोटेक्नॉलॉजी (किमान ५५% सह उत्तीर्ण) किंवा बी.एस्सी. एरिया ऑफ लाईफ सायन्स इन्क्लुडींग अॅग्रीकल्चरल / हॉर्टिकल्चरल / पोस्ट हारवेस्ट टेक्नॉलॉजी / बी.टेक./ बी.ई. फुड टेक्नॉलॉजी / फुड प्रोसेसिंग टेक्नॉलॉजी/ अॅग्रील. प्रोसेस अभियांत्रिकी / रसायन टेक्नॉलॉजी / केमिकल टेक्नॉलॉजी/ केमिकल अभियांत्रिकी/ बी.फार्मसी. / बी.व्होक. इन रिलेवॅंट सबजेक्ट	रु. ४,००,०००/-	रु. २,४०,०००/-	
एकुण	०४					एकुण	रु. २०,००,०००/-	रु. १२,००,०००/-	

प्रस्तुत प्रकरणी शैक्षणिक वर्ष २०२२-२०२३ पासुन उपरोक्त कोष्टकात विनर्दिष्टित करण्यात आल्यानुसार एकुण ०२ पदव्युत्तर अभ्यासक्रम व ०२ पदविका अभ्यासक्रम सुरु करणेबाबत प्रस्ताव सादर करण्यात आलेले आहे तद्अनुषंगाने शैक्षणिक शुल्कापोटी रु. २०,००,०००/- महसूल जमा होणार असून रु. १२,००,०००/- (६०%) वार्षिक खर्च येणार आहे. सदरील अभ्यासक्रम रोजागाराभिमुख व कौशल्यपूर्ण असल्यामुळे विद्यमान शैक्षणिक वर्षापासून सुरु करण्यास हरकत नाही.

मा. कुलगुरु महोदयांना मान्य असल्यास रसायन तंत्रज्ञान विभागामध्ये शैक्षणिक वर्ष २०२२-२०२३ पासून एम.एस्सी. फुड टेक्नॉलॉजी, एम.एस्सी. ड्रग इंटरमेडीएट टेक्नॉलॉजी, पीजी डिप्लोमा इन कॉसमेटिक टेक्नॉलॉजी व पीजी डिप्लोमा इन फुड सेफ्टी अॅण्ड क्वालिटी इत्यादी ०४ अभ्यासक्रम उपरोक्त कोष्टकात सादर केलेल्या तपशिलानुसार विद्यापरिषद व व्यवस्थापन परिषदेच्यावतीने सदरील अभ्यासक्रमास महाराष्ट्र सार्वजनिक विद्यापीठ अधिनियम २०१६ कलम १२ (७) अन्वये मान्यता दिल्यास सर्व संबंधित अभ्यासक्रम शैक्षणिक वर्ष २०२२-२०२३ पासून सुरु करण्यात यावे, असे नियोजन व सांख्यिकी विभाग, पदव्युत्तर विभाग, विभाग प्रमुख रसायन तंत्रज्ञान विभाग व अभ्यासक्रम विभाग यांनी सर्व संबंधित विभागाच्या स्तरावरून सदरील अभ्यासक्रम सुरु करण्यासाठी आवश्यक कार्यवाही करण्यात यावी, असे सर्व संबंधितांना कळविण्यात येईल.

किंवा

सदरील प्रकरण आगामी विद्यापरिषद व व्यवस्थापन परिषदेच्या बैठकीसमोर सादर करण्यात येईल.

करिता यथायोग्य आदेशास्तं व सादर . . .

मा. प्र कुलगुरु
उपकुलसचिव
(शैक्षणिक विभाग)

कक्ष अधिकारी
(शैक्षणिक विभाग)

मा. प्र कुलगुरु

मा. कुलगुरु

01 AUG 2022

**PROPOSED SCHEME
FOR TWO YEAR**

POST GRADUATE DEGREE (M.Sc.)

In

**DRUG AND INTERMEDIATE TECHNOLOGY
(First and Second Year)**

(Effective from Academic year 2022-2023 & onwards)



**Dr. Babasaheb Ambedkar Marathwada University,
Aurangabad-431004 (MS), India**

**POST GRADUATE
DEGREE (M.Sc.)**

IN

**DRUG AND
INTERMEDIATE
TECHNOLOGY**

GENERAL INFORMATION

1.	Name of the course	Post Graduation in Drug and Intermediate Technology (M.Sc.)
2.	Sector	Chemical Technology/Chemical Sciences/Pharmaceutical Technology
3.	Code	PG-DIT
4.	Eligibility	Eligibility: 1. B.Sc. with Chemistry as a principal Subject / Chemistry at Subsidiary level. 2. B. Pharmacy 3. B. Tech./B.E. Admission criteria: <u>B.Sc.</u> (Chemistry)/B. Pharmacy/B. Tech. and B.E. (with specialization in Pharmaceutical and Fine Chemicals /Chemical Engineering) with min 55% marks. Examination Type: Semester wise
5.	Admission Criteria	As per University rule.
6.	Duration of course	Two year (four semesters)- Full time
7.	Course Fees	Rs.40, 000/- per candidate/annum (includes tuition fee, Laboratory fee, admission & examination fee etc.) – Annexure -I
8.	Intake capacity	20 Students
9.	Medium of Instructions	English
10.	Vision	Enrich research, teaching skill and employability of the students with the execution of best practices.
11.	Mission	Empower students and teachers in various fields on the basis of global and local resources by enriching power within them.

12.	Terminal Competency	<p>After completion of this post graduate diploma, the candidates would be able to:</p> <p>a) To develop proficiency skill in Drug and Intermediate Technology.</p> <p>b) Operating & maintenance the modern processing equipments & machineries.</p> <p>c) To be expertise in different chemical processes with quality and safety.</p> <p>d) To know the advances in various unit operations involved in processing.</p> <p>e) To acquaint with Drug and Intermediate safety management system.</p>
13.	Program Educational Objectives (PEO)	<ul style="list-style-type: none"> • To encourage students to develop curiosity in Drug and Intermediates. • To inspire students to be an entrepreneur. • To teach good laboratory practice and skills. • To teach students to analyze data from experiments or from other sources. • To provide students with some insight into future career prospect in the fields related to Drug and Intermediates.
14.	Program Outcomes (PO)	<p>PO1: Explain the application of Drug and Intermediates technology.</p> <p>PO2: To provide a basic understanding of chemical processes and the scientific method.</p> <p>PO3: Learning about and practicing the safe and responsible use of chemicals.</p> <p>PO4: Apply advanced methods in Drug and Intermediates technology.</p> <p>PO5: Review of legislative approaches for the management of Drug and Intermediates.</p>

15. **Grading System**

The grading reflects a student-own proficiency in the course. A ten point rating scale shall be used for the evaluation of the performance of the students to provide letter grade for each course and overall grade for the program. Grade points are based on the total number of marks obtained by him / her in all heads of the examination of the course. The grade points and their equivalent range of marks are shown in Table-I

Table – I : Grade and Grade Points

Grade Point	Letter Grade	Description
10	O	Outstanding
9	A+	Excellent
8	A	Very Good
7	B+	Good
6	B	Above Average
5	C	Average
4	P	Pass
0	F	Fail
0	Ab	Absent

(A student obtaining Grade F and Ab should be considered failed and he/she will be required to reappear in the examination)

- Background of the Course:** India is the largest provider of generic drugs globally. Indian pharmaceutical sector supplies over 50% of global demand for various vaccines, 40% of generic demand in the US and 25% of all medicine in the UK. Globally, India ranks 3rd in terms of pharmaceutical production by volume and 14th by value. India's domestic pharmaceutical market size was recorded at \$42 billion in 2021 and is projected to expand to \$120 billion by 2030. Indian pharma exports witnessed a growth of 103% since 2013-14, from Rs. 90, 415 Crores in 2013-14 to Rs. 1,83,422 Crores in 2021-22. The exports achieved in 2021-22 is the Pharma Sector' best export performance ever. In view of this, Post Graduate Degree course (Two year – Full time) on Drug and Intermediate Technology will be offered by Department of Chemical Technology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. This P. G. Programme is intended to prepare Drug and Intermediate Technologist, Bulk Drug Experts, Pharma Scientist and others with appropriate scientific backgrounds for active job opportunities in pharma, bulk drug, intermediate industry and in the Government.

The course provides an outline of State-Of-Art theoretical information and practical experience, project work, directly and indirectly related to a better understanding of drug and intermediate technology, their origin and solutions. The program is framed for transmission of both knowledge and know-how of local importance and global significance to the students.

• **Course Overview:**

M.Sc. Drug and Intermediate Technology is mainly offered as a two-year degree course after the graduate level. This course is a conventional degree in the discipline of Pharmaceuticals/Life Science, making students equipped with knowledge of basic chemistry, specialised chemical knowledge of drugs and medicines, their synthesis, analysis as well as usage. The course is divided into four semesters over its two-year duration, where the students are taught the theoretical subjects for the first three semesters, while the last semester encompasses research and project work. Students who have completed their Bachelor of Science in Chemistry/ B. Pharmacy or its related field can apply for this course. Generally, students are admitted on the basis of merit in previous academic endeavours, while some universities also take eligibility entrance exams for the same.

Scope:

Scope of Drug and Intermediate Technology is majorly in the research and development of new medicines for pharmaceutical companies or government agencies. One can also enter the domain of teaching after completing M.Sc. Drug and Intermediate Technology by giving exams like SLET, NET etc in India. Opting for a PhD is another option available for post-graduate students.

Modules to be covered:

- Development of Drug and Intermediates
- Analytical Techniques and Quality in the Laboratory
- Molecular modeling techniques
- Medicines: Scale-up, Formulation, and Manufacture (optional)
- Project Management and Techniques
- Advanced Research Topics in Chemistry (optional)
- Quality in the Manufacture and Distribution of Medicines
- Major Research Project, Professional Practice And Employability
- Toxicology (optional)

Assessment

Assessments are undertaken on an individual, pair or small group basis, and include:

- Formal unseen closed-book examinations
- In-class tests
- Laboratory/practical reports and skills
- Oral presentations
- Themed portfolios of work
- Essays and dissertations
- Computer assignments
- Project work including planning, conducting, documenting and reporting
- Overall monitoring of safe practice in the laboratory

Careers:

The MSc Drug and Intermediate Technology course provides training either for employment or for continued studies such as a Ph.D. Student will be well equipped to pursue careers in the pharmaceutical industry or in other roles in the life science sector which also includes the biotechnological industries. Students will also be attractive to employers in the chemical industries.

Student will also develop a wide range of essential and transferable skills such as analytical Problem solving, teamwork, organisation, and information communication. As such, graduates can go on to find employment in alternate disciplines such as teaching, management, and business.

Thrust areas:

Development of new synthetic methods, synthesis of bioactive molecules, medicinal chemistry, process development of fine chemicals, drugs /pharmaceuticals/intermediate ingredients.

- **Number of Teachers Required for Course:** 03-CHB (Clock Hour Basis)
- **Number of Non-Teaching Staff Required for Course:** Nil
- **Total Revenue from the course fees/year:** Rs. 8, 00, 000/-
(Rs. 40,000/- X 20-Students)
- **Expected Expenditure: (Rs. 5, 92, 000/-)** which includes;

A. Honorium of three CHB Teachers (Rs. 4, 32, 000/-@ 600/ hr)

B. Honorium and TA/DA for Expert faculty: Rs. 30, 000/-

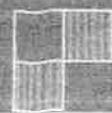
C. Recurring Expenditure (Chemicals, Consumables, Industrial Visits, etc.): Rs. 1, 30, 000/-

2022

OBE Curriculum for PG in Drug and Intermediate Technology (M.Sc.)

Academic Year 2022-23 onwards

University Department of Chemical Technology
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad,
MH, India
20/07/2022



**OBE Curriculum for PG in Drug and Intermediate Technology
Course (M.Sc.)**

Semester – I

Sr.	Course Code	Course Title	Hours per Week				Evaluation Scheme					Credits	Duration of Examination
			L	T	P	Total	CT	TA	PR	ESE	Grand Total		
1	MDT-111	Chemistry of Bioactive Heterocycles	04	-	-	04	20	-	-	80	100	04	3 Hours
2	MDT-112	Reaction Mechanism	04	-	-	04	20	-	-	80	100	04	3 Hours
3	MDT-113	Modern Drug Discovery	04	-	-	04	20	-	-	80	100	04	3 Hours
4	MDT-114	Basic Unit Operations	02	-	-	02	10	-	-	40	50	02	2 Hours
5	MDT-115	Industrial Chemistry	02	-	-	02	10	-	-	40	50	02	2 Hours
6	MDT-116	Lab I- Chemistry of Bioactive Heterocycles	-	-	08	08	-	50	50	-	100	04	6 Hours
7	MDT-117	Lab II- Reaction Mechanism	-	-	08	08	-	50	50	-	100	04	6 Hours
Total of Semester-I			16	-	16	32	80	100	100	320	600	24	-

Number of the Courses (Mandatory) : 07 (credit courses)

Total course credit Load : 32

Semester – II

Sr.	Course Code	Course Title	Hours per Week				Evaluation Scheme					Credits	Duration of Examination
			L	T	P	Total	CT	TA	PR	ESE	Grand Total		
1	MDT-121	Advanced Organic Synthetic Chemistry	04	-	-	04	20	-	-	80	100	04	3 Hours
2	MDT-122	Stereochemical Applications	04	-	-	04	20	-	-	80	100	04	3 Hours
3	MDT-123	Bioinorganic and Bioinorganic Chemistry	02	-	-	02	10	-	-	40	50	02	3 Hours
4	MDT-124	Research Methodology	02	-	-	02	10	-	-	40	50	02	2 Hours
5	MDT-125	Bulk Drug and Fine Chemical Technology	04	-	-	04	20	-	-	80	100	04	3 Hours
6	MDT-126	Lab I- Advanced Organic Synthetic Chemistry	-	-	08	08	-	50	50	-	100	04	6 Hours
7	MDT-127	Lab II- Bulk Drug and Fine Chemical Technology	-	-	08	08	-	50	50	-	100	04	6 Hours
Total of Semester-II			16	-	16	32	80	100	100	320	600	24	

Number of the Courses (Mandatory) : 07 (credit courses)

Total course credit Load : 32

Semester – III

Sr.	Course Code	Course Title	Hours per Week				Evaluation Scheme					Credits	Duration of Theory Examination
			L	T	P	Total	CT	TA	PR	ESE	Grand Total		
1	MDT-231	Advanced Analytical Techniques	04	-	-	04	20	-	-	80	100	04	3 Hours
2	MDT-232	Advanced Medicinal Chemistry	02	-	-	02	10	-	-	40	50	02	2 Hours
3	MDT-233	Chemistry of Aromatic Compounds	04	-	-	04	20	-	-	80	100	04	3 Hours
4	MDT-234	Industrial Pollution Control	02	-	-	02	10	-	-	40	50	02	2 Hours
5	MDT-235	Technology Transfer	04	-	-	04	20	-	-	80	100	04	3 Hours
6	MDT-236	Lab I-Technology Transfer	-	-	04	04	-	50	50	-	100	02	6 Hours
7	MDT-237	Research Projects-I	-	-	12	12	-	50	50	-	100	06	6 Hours
Total of Semester-III			16	-	16	32	80	100	100	320	600	24	-

Number of the Courses (Mandatory) : 07 (credit courses)

Total course credit Load : 32

Semester – IV

Sr.	Course Code	Course Title	Hours per Week				Evaluation Scheme					Credits	Duration of Theory Examination
			L	T	P	Total	CT	TA	PR	ESE	Grand Total		
1	MDT-241	Chemistry of Drug and Intermediates	04	-	-	04	20	-	-	80	100	04	3 Hours
2	MDT-242	Chiral Drug Synthesis	04	-	-	04	20	-	-	80	100	04	3 Hours
3	MDT-243	Flavor Chemistry	02	-	-	02	10	-	-	40	50	02	2 Hours
4	MDT-244	Pericyclic reactions and Photochemistry	02	-	-	02	10	-	-	40	50	02	2 Hours
5	MDT-245	Entrepreneurship Development	02	-	-	02	10	-	-	40	50	02	2 Hours
6	MDT-246	Research Projects-II	-	-	20	20	-	125	125	-	250	10	6 Hours
Total of Semester-IV			14	-	20	34	70	125	125	280	600	24	-

Number of the Courses (Mandatory) : 06 (credit courses)

Total course credit Load : 34

L:	Lectures per week	T:	Tutorial per week	P:	Practicals per week	TA:	Teachers Assessment	CT:	Class Test
PR:	Practical	ESE:	End Semester Examination	MDT:	Masters in Drug and Intermediate Technology				

PROPOSED DETAILED SCHEME

FOR TWO YEARS

MASTER OF SCIENCE

In

FOOD TECHNOLOGY

(I, II, III & IV Semester)

(Effective from Academic year 2022-2023 & Onwards)



Dr. Babasaheb Ambedkar Marathwada University,

Aurangabad-431004 (MS), India

GENERAL INFORMATION

1. Name of the course : **M.Sc. in FOOD TECHNOLOGY**
2. Sector : **Food Technology**
3. Code : PG-FT
4. Eligibility/ Qualification: BE/B.Tech in Chemical Engineering/ Bio-Technology, B.Voc. B.Tech.(Agril.Engg.),B.Tech.(FoodSci.&Tech.), BE(Mech.Engg.), B.Sc. Agriculture, Horticulture, Dairy Sci. & Technology, BE/B.Tech (Food Processing Tech.) B.Sc.(Food & Nutrition), B.Sc.(Food Sci.& Quality Control) etc.
5. Admission Criteria : Through Entrance Test/Merit Base
6. Duration of course : Two year (Four semesters) Full time ✓
7. Course Fees : Rs.20, 000/- per candidate/semester (includes tuition fee, ✓
Laboratory fee, admission & examination fee etc.)
8. Intake capacity : 20 Candidates ✓
9. Medium of Instructions: English
10. Terminal Competency : After completion of this post graduate the candidates would be able to:
 - a) To develop proficiency skill in producing different types of processed food products.
 - b) Operating & maintenance the modern processing equipment & machineries.
 - c) To make different processed food products with quality assurance and safety.
 - d) To know the advances in various unit operations involved in Food processing.
 - e) To acquaint with food Processing Technology.

Program Outcomes (POs)

PO1	Post Graduates will have an ability to apply knowledge of Food Science, Food Processing, Food Engineering and Technology
PO2	Post Graduates will have an ability to analysis the problems in food science, food processing and food technology, and will be competent to control them during foods manufacturing and storage
PO3	Post Graduates will have an ability to identify problems and design to resolve the problems in the actual situations during food processing, food quality controlling, food packaging and storage
PO4	Post Graduates will have an ability to express practical proficiency in the field of food analysis, food processing and food preservation
PO5	Post Graduates will have advanced knowledge of food microbiology, food science, food engineering, food quality and food processing technology
PO6	Post Graduates will have an ability of designing and development of food products as per the need of society keeping the value of food safety and health benefits
PO7	Post Graduates will have an ability to understand the impact of the professional scientific and technical solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO8	Post Graduates will have an ability to apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
PO9	Post Graduates will have an ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
PO10	Post Graduates will have an ability to communicate effectively for self-development
PO11	Post Graduates will have knowledge of industrial economics and management of food industries
PO12	Post Graduates will have an ability to recognize the need, and have preparations and ability to engage in independent and life-long learning in the broadest context of technological change

Program Specific Outcomes (PSOs)

PSO1	Post Graduates will apply the knowledge of food chemistry, food preservation, food processing and food packaging for the effective utilization of agricultural commodities to develop healthy and nutritious foods
PSO2	Post Graduates will design economically feasible equipment for the modernization of traditional food processing methods
PSO3	Post Graduates will apply the knowledge of food engineering and technology principles from the various aspects of food technology and related disciplines to solve practical and real-world problems

Curriculum of M. Sc. Food Technology

A two years M. Sc. Program is formulated for developing competent Food Technology for whom significant job opportunities exist in this country. The course is based on basic science involved viz. Food Chemistry, Biochemistry, Food Microbiology. Food preservation Food processing and genetically modified foods. The program obliges students to read original publications and envisages significant inputs in laboratory work, communication skill, creativity, planning, execution and critical evaluation of the studies undertaken. This program gives common basic knowledge (Food Biochemistry, Food Microbiology and Food engineering for development of new Technology of processing foods. Research Methodology in Food Science and Technology) during this course.

With liberalization of Indian economy. All-round industrial growth has been witnessed in all sectors with improvement in social and economic conditions of our people. This has created demand for more and better quality foods. With advancement in production technology, high yield levels will lead to large amount of marketable surplus of food grains and crop residues, demanding appropriate handling processing preservation, storage, marketing and utilization. The development of processing industries to preserve the perishable agricultural produce will not only improve economic and nutritional status of our population but it may help in employment generation in rural as well as urban areas of the country. This can be achieved by linking production and post-harvest technology in synergistic way.

At present the export from agro-sector represents about 16% of total Indian exports. The primary export commodities are cereals, fruits, vegetables and then processed products and marine products but fast growing especially products have also penetrated in foreign markets. Considering the contribution of these products in Indian export, it is necessary to have appropriate technology for handling and processing of agricultural produce. The importance of Food Science and Technology lies in the fact that it has capability to provide food to our population through scientific conservations, eliminating avoidable losses and making available

more balanced and nutritious food, High value products from low grade material can be produced by innovative and appropriate processing and packaging technologies and also from byproducts and residue waste using integrated approach. Thus modernization of post-harvest operations and agro-processing industries through innovative and appropriate technology has vital role to play in national economy in general and rural economy in particular. Considering the above aspects, the role of agricultural scientists does not stop at farm level but it continues till the harvested crops and animal products are processed, preserved and further modified into useful and nutritious products. Until these are utilized by the consumer. Hence, the post-harvest handling and processing need to be attended on priority basis at national level.

The postgraduate education should meet the occupational demand and absorptive capacity of the economy. Specializations offered at postgraduate level are by the large needed for jobs in research and education sector. Moreover, with development of processing industries, it is quite likely that the demand for food scientists and technologists will increase in the next few decades. Hence, specializations offered at postgraduate level need to be strengthened considering occupational needs as well as demands of the food industries. Food Science is basically interdisciplinary program involving chemistry microbiology and engineering. Hence, basic knowledge of these three discipline become mandatory if student wishes to pursue career in this discipline. In order to develop strong and need based program core courses in above disciplines need to be added for developing Food Science and Technology discipline for effective preservation processing and utilization of perishable products.

Objectives –

To enable the students to gain an insight into basic aspect of fruit and vegetable processing to understand the importance of advance techniques in food analysis.

Acquire knowledge of availability of fruits and vegetables in lean season, regarding processing of animal proteins.

Recent advances in dairy technology and to develop high quality protein concentrates and weaning foods.

Novel foodstuff. Awareness of importance of cereal legume and oil seed technology.

The students will also gain knowledge about various packaging materials and importance of packaging.

To be familiar with testing and evaluation of packing media, packaging laws and regulations. To select appropriate packaging material for a variety of foodstuffs.

To develop new food products which are marketable. Nutritionally and economically viable.

To develop entrepreneurial skills to set up small scale food industries.

- **Number of Teachers Required for PG: 03-CHB**
- **Total Revenue from the course fees/ years. 8, 00, 000/- (Rs. 40,000/- X 20-Students)**
- **Expected Expenditure: (Rs. 6, 40, 000/-)** which includes; .
 - A. Honorium of Three CHB Teachers (Rs. 4, 32, 000/- @ 600/ hrs)
 - B. Honorium and TA/DA for Expert faculty: Rs. 30, 000/-
 - C. Recurring Expenditure (Raw materials, Industrial Visits, etc.): Rs. 50, 000/-
 - D. Chemicals & Glasswares: Rs.50000/-
 - E. Consumables: Rs.50000/-
- **Career Opportunities:** After completion of the Post Graduate course the candidates will have ample of opportunities in food processing industries such as; Food Safety Professionals, Food Analyst/ Executive, Food technologists, Procurement officers, Food Storage Supervisor, Quality Control Executive, Marketing Assistant, Distribution Assistant, Retail Supervisor Store Assistant, Entrepreneur in Food Processing and logistics, Food Certifications, etc.

Work load for M. Sc.

M. Sc. I (Sem I and II)	Theory	Practicals
	16hr	16hr
Seminars	2hr	
Oral Exam	2hr	
	-----	-----
	20hr	
M. Sc. II (Sem III and IV)	Theory	Practicals
	16hr	16hr
Seminars	2hr	
Oral Exam	2hr	
	-----	-----

It is also suggested that every student undertake two hours library work under the supervision of faculty members. It is envisaged that the research projects (dissertation and specializations will inculcate aptitude for research and practical applications. The students will also have basic inputs

on communications skills and computers knowledge (information technology) and learn the basics of scientific writing and presentation.

Admission:

Intake capacity:

1. 20 students every year on the basis of entrance examination/Merit basis.

Eligibility for Admission:

A) : BE/B.Tech in Chemical Engineering/ Bio-Technology, B.Voc.
 B.Tech.(Agril.Engg.), B.Tech.(FoodSci.&Tech.), BE(Mech.Engg.), B.Sc.
 Agriculture, Horticulture, Dairy Sci. & Technology, BE/B.Tech (Food Processing
 Tech.) B.Sc.(Food & Nutrition), B.Sc.(Food Sci.& Quality Control) etc.
 Course . Structure:

SEMESTER –I	Credits	Marks
MFT 101: Principles of food Preservation	4	100
MFT 102: Food Chemistry	4	100
MFT 103: Food Microbiology and Food Safety	4	100
MFT 104: Research Methodology	4	100
MFT 105: Laboratory Course I	8	200
	24	600

SEMESTER –II	Credits	Marks
MFT 201: Food Process Technology-I	4	100
MFT 202: Food Packaging	4	100
MFT 203: Food Analysis	4	100
MFT 204: Food Additives	4	100
MFT 205: Laboratory Course II	8	200
	24	600

SEMESTER –III	Credits	Marks
MFT 301: Food Process Technology-II	4	100
MFT 302: Human Nutrition & Nutraceuticals	4	100
MFT 303: Food Resolusion & Quality Control	4	100
MFT 304: Project -I	4	100
MFT 305: Laboratory Course III	8	200
	24	600

SEMESTER –IV	Credits	Marks
MFT-405: Project Report- II (Dissertation)	24	600
		600

M. Sc. FOOD SCIENCE AND TECHNOLOGY STRUCTURE (CBCS PATTERN) (2019-20)

M. Sc. Part – I

SEMESTER – I (Duration – Six Month)													
TYPE	SR. NO.	COURSE CODE	TITLE OF THE PAPER	TEACHING SCHEME				EXAMINATION SCHEME					
				Theory and Practical		CREDITS	University assessment (UA)			Internal Assessment (IA)			
				LECTURES (per week)	HOURS (per week)		MAX. MARKS	MINI. MARKS	EXAM. HOURS	MAX. MARKS	MINI. MARKS	EXAM. HOURS	
CGPA	1	MFT 101	Principles of food Preservation	4	4	4	80	32	3	20	8	1	
	2	MFT 102	Food Chemistry	4	4	4	80	32	3	20	8	1	
	3	MFT 103	Food Microbiology and Food Safety	4	4	4	80	32	3	20	8	1	
	4	MFT 104	Research Methodology	4	4	4	80	32	3	20	8	1	
	5	MFT 105	Laboratory Course I	--	16	8	200	80	---	---	---	*	
Total (A)				---	---	24	520	---	---	80	---	---	
SEMESTER – II (Duration – Six Month)													
1	MFT 201	Food Technology-I	Process	4	4	4	80	32	3	20	8	1	
2	MFT 202	Food Packaging		4	4	4	80	32	3	20	8	1	
3	MFT 203	Food Analysis		4	4	4	80	32	3	20	8	1	
4	MFT 204	Food Additives		4	4	4	80	32	3	20	8	1	
5	MFT 205	Laboratory Course II		--	16	8	200	80	---	---	---	*	
Total (B)				---	---	24	520	---	---	80	---	---	
Total (A + B)						48	1040	---	---	160	---	---	

M. Sc. FOOD SCIENCE AND TECHNOLOGY STRUCTURE (CBCS PATTERN) (2019-20)

M. Sc. Part – II

SEMESTER – III (Duration – Six Month)										EXAMINATION SCHEME				
SR. NO	COURSE CODE	TITLE OF THE PAPER	TEACHING SCHEME			University assessment (UA)			Internal Assessment (IA)					
			LECTURES (per week)	HOURS (per week)	CREDITS	MAX. MARKS	MINI. MARKS	EXAM. HOURS	MAX. MARKS	MINI. MARKS	EXAM. HOURS			
CGPA	MFT 301	Food Process Technology-II	4	4	4	80	32	3	20	8	1			
	MFT 302	Human Nutrition & Nutraceuticals	4	4	4	80	32	3	20	8	1			
	MFT 303	Food Resolution & Quality Control	4	4	4	80	32	3	20	8	1			
	MFT 304	Project -I	4	4	4	80	32	3	20	8	1			
	MFT 305	Laboratory Course III	4	16	8	200	80	---	---	---	*			
Total (C)			---	---	24	520	---	---	80	---	---			
SEMESTER – IV (Duration – Six Month)														
1	MFT-405	Project Report- II (Dissertation)	---	40	20	500	---	---	---	---	*			
Total (D)			---	---	22	550	---	---	80	---	---			
Total (C + D)			---	---	48	1070	---	---	160	---	---			

**PROPOSED SCHEME AND DETAILED
SYLLABUS FOR ONE YEAR**

**POST GRADUATE DIPLOMA
IN
FOOD SAFETY AND QUALITY
(First and Second Semester)**

(Effective from Academic year 2022-2023 & onwards)



**Dr. Babasaheb Ambedkar Marathwada University,
Aurangabad-431004 (MS), India**

GENERAL INFORMATION

1.	Name of the course	PG Diploma in Food Safety and Quality
2.	Sector	Food Technology
3.	Code	PGD-DFS
4.	Eligibility	M.Sc. in Food Science and Nutrition/ Food Science and Technology/ Biotechnology/ Biochemistry / Microbiology / Agriculture / Horticulture / Post Harvest Technology or M. Tech. in Food Technology/ Food Processing Technology/ Food Biotechnology with minimum of 55% marks or B.Sc. with 55% marks in any area of life sciences including Agriculture / Horticulture / Post Harvest Technology / B. Tech./ B.E. in Food Technology/ Food Processing Technology/ Agril. Process Engineering/ Chemical Technology / Chemical Engineering /B. Pharmacy/ B. Voc. in relevant subjects.
5.	Admission Criteria	Through Entrance Test
6.	Duration of course	One year (two semesters)- Full time
7.	Course Fees	Rs.20, 000/- per candidate/annum (includes tuition fee, Laboratory fee, admission & examination fee etc.) – Annexure -I
8.	Intake capacity	20 Students
9.	Medium of Instructions	English
10.	Terminal Competency	After completion of this post graduate diploma, the candidates would be able to: a) To develop proficiency skill in producing different types of processed food products. b) Operating & maintenance the modern processing equipments & machineries. c) To make different processed food products with quality assurance and safety. d) To know the advances in various unit operations involved in processing. e) To acquaint with food safety management system.

11.	Program Educational Objectives (PEO)	<ol style="list-style-type: none"> To illustrate the importance of food safety and quality; provide knowledge, training and expertise in the production and regulation of safe food To develop a multidisciplinary network of experts to foster food safety and quality research, and provide platform for collaboration to researchers and industry. To create skilled manpower to support the food industry. 																														
12.	Program Outcomes (PO)	<p>PO1: Explain the application of food safety and quality management systems</p> <p>PO2: Evaluate the chemical and microbiological quality of food samples</p> <p>PO3: Analyse and identify potential risk of hazards in food supply chain</p> <p>PO4: Apply HACCP principles in a food safety plan</p> <p>PO5: Review of legislative approaches for the management of food safety</p>																														
13.	Grading System	<p>The grading reflects a student-own proficiency in the course. A ten point rating scale shall be used for the evaluation of the performance of the students to provide letter grade for each course and overall grade for the Bachelor Program. Grade points are based on the total number of marks obtained by him / her in all heads of the examination of the course. The grade points and their equivalent range of marks are shown in Table-I</p> <p style="text-align: center;">Table – I : Grade and Grade Points</p> <table border="1" data-bbox="555 1256 1331 1693"> <thead> <tr> <th>Grade Point</th> <th>Letter Grade</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>O</td> <td>Outstanding</td> </tr> <tr> <td>9</td> <td>A+</td> <td>Excellent</td> </tr> <tr> <td>8</td> <td>A</td> <td>Very Good</td> </tr> <tr> <td>7</td> <td>B+</td> <td>Good</td> </tr> <tr> <td>6</td> <td>B</td> <td>Above Average</td> </tr> <tr> <td>5</td> <td>C</td> <td>Average</td> </tr> <tr> <td>4</td> <td>P</td> <td>Pass</td> </tr> <tr> <td>0</td> <td>F</td> <td>Fail</td> </tr> <tr> <td>0</td> <td>Ab</td> <td>Absent</td> </tr> </tbody> </table> <p>(A student obtaining Grade F and Ab should be considered failed and he/she will be required to reappear in the examination)</p>	Grade Point	Letter Grade	Description	10	O	Outstanding	9	A+	Excellent	8	A	Very Good	7	B+	Good	6	B	Above Average	5	C	Average	4	P	Pass	0	F	Fail	0	Ab	Absent
Grade Point	Letter Grade	Description																														
10	O	Outstanding																														
9	A+	Excellent																														
8	A	Very Good																														
7	B+	Good																														
6	B	Above Average																														
5	C	Average																														
4	P	Pass																														
0	F	Fail																														
0	Ab	Absent																														

- **Background of the Diploma Course:** Marathwada region is known for growing the number of fruit and vegetable crops, Cereals, Oilseeds, Pulses, Spices and condiments etc. in Maharashtra state. This region also houses around 95 to 150 Food processing and beverage industries including Food Parks, Mega Food Park, Paithan, food industries under DMIC project, and world class breweries such as Carlsberg, United breweries, ABD and beverage industries like Pepsico India Holdings Pvt. Ltd., Hindustan Coca-Cola Beverages Pvt. Ltd. etc. Therefore, there is growing demand for technical manpower with adequate skills of Food Safety and Quality in order to meet the industrial demands according to FSSAI standards. Modern Food Safety Regulations in India has reached global standards with the introduction of Food Safety and Standards Act 2006 in the year 2011. With this, requirement of adequately trained manpower to be a part of Food Safety Quality Assurance and Regulatory Systems has increased immensely. With the enormous expansion of food sector (Manufacturing, retail distribution and hospitality sector) and customer awareness, safety and quality assurance has become a very vital hitch to be addressed in the current decade. This has opened an enormous job opportunities for adequately trained human resource in the area.

In view of this, Post Graduate Diploma course (One year – Full time) on Food Safety and Quality will be offered by Department of Chemical Technology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. This P.G. Diploma Programme is intended to prepare food scientists, food engineers, microbiologists and others with appropriate scientific backgrounds for active job opportunities in food safety and quality assurance, monitoring and certification process in the food industry and in the Government.

The course provides an outline of State-Of-Art theoretical information and practical experience, directly and indirectly related to a better understanding of food safety problems, their origin and solutions. The program is framed for transmission of both knowledge and know-how of local importance and global significance to the students.

- **Number of Teachers Required for Diploma:** 02-CHB (Clock Hour Basis)
- **Number of Non-Teaching Staff Required for Diploma:** Nil
- **Total Revenue from the course fees/year:** Rs. 4, 00, 000/-
(Rs. 20,000/- X 20-Students)

- **Expected Expenditure: (Rs. 3, 00, 000/-)** which includes;

- A. Honorium of two CHB Teachers (Rs. 2, 40, 000/-@ 600/ hr)
- B. Honorium and TA/DA for Expert faculty (15 Lectures): Rs. 30, 000/-
- C. Recurring Expenditure (Raw materials, Industrial Visits, etc.): Rs. 30, 000/-

- **Career Opportunities:** After completion of the diploma course the candidates will have ample of opportunities in food processing industries such as; Food Safety Professionals, HACCP Coordinator, Food Safety Specialist, Food QA or QC Supervisor, Sanitation Coordinator, Food Safety Program (i.e., BRC/SQF) Practitioner, Food Analyst/ Executive, Food technologists, Procurement officers, Food Storage Supervisor, Quality Control Executive, QA executive, Marketing Assistant, Distribution Assistant, Retail Supervisor, Store Assistant, Entrepreneur in Food Processing and logistics, Product Development Technician, Food Microbiologist, Food Certifications, food safety auditor etc.

OBE Curriculum for PG Diploma in Food Safety and Quality Course

Semester – I

Sr	Course Code	Course Title	Hours per Week				Evaluation Scheme					Credits	Duration of Theory Examination
			L	T	P	Total	CT	TA	PR	ESE	Grand Total		
1	DFS -111	Introduction to Food Safety	04	-	-	04	20	-	-	80	100	4	3 Hours
2	DFS -112	Techniques in Food Analysis	04	-	-	04	20	-	-	80	100	4	3 Hours
3	DFS -113	Food Standards and Quality Control	03	-	-	03	20	-	-	80	100	3	3 Hours
4	DFS -114	Food Toxicology	03	-	-	03	20	-	-	80	100	3	3 Hours
5	DFS -115	Lab-Introduction to Food Safety	-	-	04	04	-	25	25	-	50	2	4 Hours
6	DFS -116	Lab-Techniques in Food Analysis	-	-	04	04	-	25	25	-	50	2	4 Hours
7	DFS -117	Lab-Food Standards and Quality Control	-	-	04	04	-	25	25	-	50	2	4 Hours
Total of Semester-I			14	-	12	26	80	75	75	320	550	20	-

Number of the Courses (Mandatory) : 07 (credit courses)
Number of deficiency courses : -
Total Courses offered : 07
Total course credit Load (hrs) : 26 (14 + 00 + 12)

Semester – II

Sr.	Course Code	Course Title	Hours per Week				Evaluation Scheme					Credits	Duration of Theory Examination
			L	T	P	Total	CT	TA	PR	ESE	Grand Total		
1	DFS -121	Food Safety and Standards Acts	03	-	-	03	20	-	-	80	100	03	3 Hours
2	DFS -122	Food Safety Auditing	03	-	-	03	20	-	-	80	100	03	3 Hours
3	DFS -123	Major Project	-	-	20	20	-	125	125	-	250	10	4 Hours
4	DFS -124	Lab- Food Safety Auditing	-	-	04	04	-	25	25	-	50	02	4 Hours
5	DFS-125	Seminar	-	-	04	04	-	50	-	-	50	02	
Total of Semester-II			06	-	28	34	40	200	150	160	550	20	-

Number of the Courses (Mandatory) : 05 (credit courses)
Number of deficiency courses : -
Total Courses offered : 05
Total course credit Load (hrs) : 34 (06 + 00 +28)

***Maximum three hours will be allotted to the concerned teacher for monitoring and supervision of the project work with respect to Food Technology specialization.**

L:	Lectures per week	T:	Tutorial per week	P:	Practicals per week	TA:	Teachers Assessment	CT:	Class Test
PR:	Practical	ESE:	End Semester Examination	DFS:	Diploma in Food Safety and Quality				

CURRICULUM – OVERVIEW

Semester I

Course Code	Title of the Course	Credits
DFS -111	Introduction to Food Safety	4
DFS -112	Techniques in Food Analysis	4
DFS -113	Food Standards and Quality Control	3
DFS -114	Food Toxicology	3
DFS -115	Lab- Introduction to Food Safety	2
DFS -116	Lab-Techniques in Food Analysis	2
DFS -117	Lab-Food Standards and Quality Control	2
	Total credits of Semester I	20

Semester II

Course Code	Title of the Course	Credits
DFS -121	Food Safety and Standards Acts	3
DFS -122	Major Project (Any one of the following areas): <ul style="list-style-type: none"> • Food Safety Regulations • Food Safety in Manufacturing Sector • Food Safety in Retail Sector • Food Safety in Catering Sector • Food Safety Auditing 	10
DFS -123	Food Safety Auditing	3
DFS -124	Lab- Food Safety Auditing	2
DFS -125	Seminar	2
	Total credits of Semester I & II	40

Note: DFS- Diploma in Food Safety & Quality courses

UNIVERSITY DEPARTMENT OF CHEMICAL TECHNOLOGY

(Faculty of Science & Technology)

Syllabus of First Year PG Diploma (Food Safety and Quality)

(Semester-I)

Subject Code No.: DFS -111	Subject Title: Introduction to Food Safety
Teaching Scheme:	Theory Examination (Duration): 3 hrs
Theory: 4 hrs/week	Theory Examination (Marks): 80 Marks
Credits: 04	Class Test: 20 Marks

Course Objective: The student will understand the basic concepts of food safety w.r.t. microbiological and chemical aspects and quality attributes of various foods.		
Course Outcome: The student will be able to identify various hazards, its evaluation for various foods and their impacts on human health.		
Unit	Course Content	Periods
I	History of food regulations in India, Concept of food safety & quality, FSS Act and FSSAI regulations, Quality attributes- chemical, nutritional, microbial, physical and sensory; their measurement and evaluation; sensory panel.	12
II	Food Sanitation and safety: Importance and significance of microorganisms in food safety, intrinsic and extrinsic factors affecting the growth of microorganisms in food. Factors contributing to physical, chemical and biological contamination in food chain.	12
III	Food borne diseases, Food intoxication, Food infection, prevention and control of food borne hazards, definition and regulation of food sanitation, sources of contamination, personal hygiene-food handlers, cleaning compounds, sanitation methods, waste disposal strategy (solid and liquid waste) and pest control	12
IV	Food adulteration: common adulterants, simple tests for detection of adulteration. Food additives- classification, functional role and safety issues, types of adulteration and recent trends in food adulteration. Pesticides and veterinary drugs: Detection and quantification; Processing contaminants: Detection, quantification and health hazards of direct and indirect contaminants	12
V	Food Quality Indices: Meat and meat products, fish and fish products, milk and dairy products, vegetables, fruits and their products, grain, pulses and oil seeds, coffee, tea and spices.	12

Text books

1. Early, R. (2006) Guide to Quality Management Systems for the Food Industry, Blackie, Academic and professional, London.

2. Gould, W.A and Gould, R.W. (2005) Total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.
3. FAO (2006) Manuals of Food Quality Control. 2-Additives Contaminants Techniques, Rome.
4. P. K. Das, Food Safety and Standards Act, 2006
5. Pelczar, M.I., and Reid, R.D. (2009) Microbiology, 5th Ed., McGraw Hill Inc., New York.
6. James, M.J. (2007) Modern Food Microbiology, 2nd Ed., CBS Publisher, New Delhi
7. Adams, M.R., and Moss, M.G., (2005) Food Microbiology, 1st Ed., New Age International (P) Ltd., New Delhi.
8. Frazier, W.C. (2008) Food Microbiology, 4th Ed., McGraw Hill Inc., New York.
9. L.J. Prescott and Dunn (1940), Industrial Microbiology, MC Graw Hill Book Co. Inc. New York.
10. Casida L.E. (1964), Industrial Microbiology, John Wiley and Son Inc. New York,
11. Branen, A.L., Davidson, P.M. & Salminen, S. (2007) Food Additives, 2nd Ed., Marcel Dekker.
12. George, A.B. (2006) Encyclopedia of Food and Color Additives, Vol. III, CRC Press, LLC. Boca Raton, FL
13. George, A.B. (2008) Fenaroli's Handbook of Flavor Ingredients, 5th Ed, CRC Press, LLC. Boca Raton, FL
14. Morton, I.D., & MacLeod, A.J. (2008) Food Flavors, Part A, B & C. Elsevier.

Subject Code No.: DFS -112		Subject Title: Techniques in Food Analysis
Teaching Scheme:		Theory Examination (Duration): 3 hrs
Theory: 4 hrs/week		Theory Examination (Marks): 80 Marks
Credits: 04		Class Test: 20 Marks
Course Objective:		
The student will be acquainted with various analytical quality control methods used in industries.		
Course Outcome:		
The student will learn principles and application of various analytical methods for safety and quality evaluation of different food categories.		
Unit	Course Content	Periods
I	Food laboratories: need for food analysis, accreditation of food laboratory, referral laboratories. functions of food analysts, hierarchy of food safety authorities, analysis of food samples and reports, other regulatory provisions pertaining to analysis of food	12
II	Validation of analytical methods: Good Laboratory Practices (GLP)- history of GLP, areas of application, facilities, test systems, test and reference items, Standard Operating Procedure (SOP), study performance and reporting.	12
III	Analytical method used for quality determination: chemical and physical, microbiological, biochemical and sensory analysis.	12
IV	Analytical methods of determination of basic food components: protein, saccharides, lipids, vitamins, water, minerals and trace elements, sensory active compounds, anti-nutritive and natural toxic compounds, food additives and food	12

	contaminants.	
V	Advanced laboratory techniques: principle, working and application of GC, HPLC, HPTLC, LC/MS, ICPMS and PCR, real time PCR, ELISA, Triple Quadrupole system.	12

Text Books

1. The training manual for Food Safety Regulators. Vol.II- Food Safety regulations and food safety management. (2011) Food safety and Standards Authority of India. New Delhi.
2. AOAC International. (2005) Official methods of analysis of AOAC International. 17th Ed., current through 1st revision. Gaithersburg, MD, USA, Association of Analytical Communities.
3. Ranganna, S. (2005). Handbook of analysis and quality control for fruits and vegetables products, 3rd edition, Tata Mcgraw – Hills.
4. Amihud Kramer and Bernard A. Twigg (2017) Quality Control for The Food Industry Fundamentals & Applications: 1
5. James P. Dux () Handbook of Quality Assurance for the Analytical Chemistry Laboratory
6. An Introduction to Practical Biochemistry by D.T. Plummer
7. Quality Control in Food Industry Vol. I by S.M. Herschdoerfer
8. Principles of sensory evaluation of foods by M.S. Amerine, Academic press, New York
9. Pomeraz, Y. and MeLoari, C.E. (2008) Food Analysis: Theory and Practice, CBS publishers and Distributor, New Delhi.
10. Bryan, F.L. (2007) Hazard Analysis Critical Control Point Evaluations A Guide to Identifying Hazards and Assessing Risks Associated with Food Preparation and Storage. World Health Organization, Geneva.
11. Kirk, R.S and Sawyer, R. (2005) Pearson's Composition and Analysis of Foods, Longman Scientific and Technical. 9th Edition, England.

Subject Code No.: DFS -113		Subject Title: Food Standards and Quality Control	
Teaching Scheme:		Theory Examination (Duration): 3 hrs	
Theory: 3 hrs/week		Theory Examination (Marks): 80 Marks	
Credits: 03		Class Test: 20 Marks	
Course Objective:			
To explain the national and international food laws and regulations.			
Course Outcome:			
The student will be able to know about national and international food standards and their role in ensuring Food Safety and Quality			
Unit	Course Content	Periods	
I	Principal aspects of sampling of food: Importance of sample collection, sampling tools and containers, sample collection techniques, sampling for microbiological analysis of food, routine versus investigational sampling, quantity of sample to be collected, packaging and sealing of sample, dispatch of sample, documentation and commodity specific sampling procedure.	9	
II	Codex Alimentarius Commission (CODEX): Introduction, standards, codex of practice, guidelines and recommendations, applying codex standards, Codex India.	9	

	core functions of National Codex Contact Point, National Codex Committee of India	
III	International Organization of Standardization (ISO): Overview, structure, interpretation and case studies of food safety and Quality management including ISO-22000, ISO-9001:2000, ISO22000:2005, ISO 17025/CODES/GLP, Retailers standards: BRC food and BRC IOP standards, IFS, SQF: 1000, SQF: 2000.	9
IV	Hazard Analysis Critical Control Point (HACCP): History, structure, pre- requisites and principles, HACCP applications, HACCP based SOPs.	9
V	Good Manufacturing Practices (GMP), Good Hygienic Practices (GHP), Good Agricultural Practice (GAP), Good Veterinary Practice (GVP), Storage and distribution of food, sanitation and safety in food services.	9

Text Books

1. The training manual for Food Safety Regulators. Vol.II- Food Safety regulations and food safety management. (2011) Food safety and Standards Authority of India. New Delhi
2. Mortimore, S., and Wallace, C., (2005) HACCP: A practical approach, 2nd Ed, Aspen Publication.
3. Surak, J.G., and Wilson, S. (2007) American Society for Quality, 2nd Ed., Quality Press.
4. Food Safety and Standards Act, 2006 --- Commercial Law Publications, New Delhi
5. The Food Safety and Standards Act, 2006 (Along with Rules & Regulations) --- Commercial Law Publications, New Delhi

Subject Code No.: DFS -114		Subject Title: Food Toxicology
Teaching Scheme:		Theory Examination (Duration): 3 hrs
Theory: 3 hrs/week		Theory Examination (Marks): 80 Marks
Credits: 03		Class Test: 20 Marks
Course Objective:		
To study the principles of toxicology and occurrence of natural toxins, allergens, drug residues and environmental contaminants.		
Course Outcome:		
The student will learn identification and evaluation of various toxic compounds in foods.		
Unit	Course Content	Periods
I	Principles of Toxicology: classification of toxic agents; characteristics of exposure; spectrum of undesirable effects; interaction and tolerance; biotransformation and mechanisms of toxicity. Evaluation of toxicity: risk vs. benefit: experimental design and evaluation: prospective and retrospective studies: Controls: Statistics (descriptive, inferential): animal models as predictors of human toxicity: Legal requirements and specific screening methods: LD ₅₀ and TD ₅₀ : in vitro and in vivo studies; clinical trials.	10
II	Natural toxins in food: natural toxins of importance in food- toxins of plant and animal origin; microbial toxins (e.g., bacterial toxins, fungal toxins and Algal toxins). natural occurrence, toxicity and significance, determination of toxicants in foods and their management.	8

III	Food allergies and sensitivities: natural sources and chemistry of food allergens; true/untrue food allergies; handling of food allergies; food sensitivities (anaphylactoid reactions, metabolic food disorders and idiosyncratic reactions); Safety of genetically modified food: potential toxicity and allergenicity of GM foods. Safety of children consumables.	9
IV	Environmental contaminants and drug residues in food: fungicide and pesticide residues in foods; heavy metal and their health impacts; use of veterinary drugs (e.g., Malachite green in fish and β - agonists in pork); other contaminants in food, radioactive contamination of food, Food adulteration and potential toxicity of food adulterants.	9
V	Food additives and toxicants added or formed during food processing; safety of food additives; toxicological evaluation of food additives; food processing generated toxicants: nitroso-compounds, heterocyclic amines, dietary Supplements and toxicity related to dose: common dietary supplements; relevance of the dose; possible toxic effects.	9

Text Books

1. Helferich, W., and Winter, C.K. (2007) Food Toxicology, CRC Press, LLC. Boca Raton, FL
2. Shibamoto, T., and Bjeldanes, L. (2009) Introduction to Food Toxicology, 2nd Ed. Elsevier Inc., Burlington, MA.
3. Watson, D.H. (1998) Natural Toxicants in Food, CRC Press, LLC. Boca Raton, FL
4. Duffus, J.H., and Worth, H.G. J. (2006) Fundamental Toxicology, The Royal Society of Chemistry
5. Stine, K.E., and Brown, T.M. (2006) Principles of Toxicology, 2nd Ed. CRC Press.
6. Tönu, P. (2007) Principles of Food Toxicology. CRC Press, LLC. Boca Raton, FL.

Subject Code No.: DFS-115	Subject Title: Lab: Introduction to Food Safety
Teaching Scheme:	Practical Examination (Duration): 4 hrs
Practical: 4 hrs/week	Practical Examination (Marks): 25
Credits: 2	Teachers Assessment: 25 marks

List of Practicals

Sr. no.	Topics	No. of Experiments
1.	Determination of Physico-chemical parameters of given food samples	1
2.	Determination of Microbial quality attributes of given food samples	1
3.	Sensory evaluation of given food samples by various methods	1
4.	Determination of textural quality profile	1
5.	Enumeration of microorganisms: a. Direct count b. Total aerobic count c. Selective media	2

6.	Estimation of Salmonella / Shigella / Staphylococcus from food samples	2
7.	Estimation of fungal toxins from different foods (Different types of foods)	2
8.	Detection and quantification of pesticides	1
9.	Detection and quantification of environmental chemicals - heavy metals, toxic residues, radioactive isotopes	2
10.	Detection and quantification of food additives	1
11.	Detection and quantification of food colorants and sweeteners	1
12.	Visit to Food processing unit to study microbial and chemical safety	1
	Total	16

Subject Code No.: DFS-116	Subject Title: Lab-Techniques in Food Analysis
Teaching Scheme:	Practical Examination (Duration): 4 hrs
Practical: 4 hrs/week	Practical Examination (Marks): 25
Credits: 2	Teachers Assessment: 25 marks

List of Practicals

Sr. no.	Topics	No. of Experiments
1.	Calibration of pipettes, scales and dispensers	1
2.	Calibration of selected equipments	2
3.	Equipment Maintenance, record keeping and reporting of results	1
4.	Estimation of proximate from food samples	1
5.	Study of different chromatographic techniques	2
6.	Identification of sugars in fruit juice using TLC	1
7.	Separation of amino acids by two-dimensional paper chromatography	1
8.	Estimation of phytic acid using spectrophotometer	1
9.	Estimation of vitamins from food samples	1
10.	Estimation of minerals from food samples	1
11.	Estimation of trace elements from food samples	1
12.	Analysis of heavy metals	1
13.	Estimation of mycotoxins from food samples	1
14.	Visit to Food Analysis Laboratory	1
	Total	16

Subject Code No.: DFS-117	Subject Title: Lab-Food Standards and Quality Control
Teaching Scheme:	Practical Examination (Duration): 4 hrs
Practical: 4 hrs/week	Practical Examination (Marks): 25
Credits: 2	Teachers Assessment: 25 marks

List of Practicals

Sr. no.	Topics	No. of Experiments
1.	Collection of food samples – sampling, collection, transport and storage, commodity specific sampling procedure for microbiological analysis of food	2
2.	Sampling Quantity, packaging and sealing of sample, dispatch of sample, documentation and commodity specific sampling procedure for chemical analysis of foods	2
3.	Evaluation of food products as per standards	2
4.	Hazard Analysis and Critical Control Point (HACCP) of Milk and milk products	1
5.	Hazard Analysis and Critical Control Point (HACCP) of Cereals and cereal products	1
6.	Hazard Analysis and Critical Control Point (HACCP) of fish, Meat and meat products	1
7.	Hazard Analysis and Critical Control Point (HACCP) of Bakery products	1
8.	Hazard Analysis and Critical Control Point (HACCP) of Fruits and vegetables	1
9.	Design label for any food product as per standards	1
10.	Implementation procedure of ISO 22000	1
11.	Preparation of documentation and records	1
12.	Auditing- surveillance, mock audit	1
13.	Visit to units with GMP, ISO, HACCP certified plants	1
	Total	16

Semester - II

Subject Code No.: DFS -121 Teaching Scheme: Theory: 3 hrs/week Credits: 03	Subject Title: Food Safety and Standards Acts Theory Examination (Duration): 4 hrs Theory Examination (Marks): 80 Marks Class Test: 20 Marks
---	---

<p>Course Objective: The student will get significance of FSS act and implementation of its regulations.</p> <p>Course Outcome: The student will capable in application of various regulations of FSS act for different categories of food products.</p>
--

Unit	Course Content	Periods
I	Food Safety and Standards Act: Salient features of food safety and standards Act, 2006, administration at central and state level, functions, duties and responsibilities of food safety regulators, implementation of food regulation – FSS act, 2006 including licensing and registration, inspection and reports, improvement notices and prohibition Orders	9
II	Food safety standards of licensing and registration of food Business regulations, 2011: short title, commencement, definitions, licensing and registration of food business, schedule I, II, III, IV. general requirements of hygienic and sanitary practices to be followed by all food business operators applying license, specific hygienic and sanitary practices to be followed by food business operator engaged in manufacturing, processing, storage and selling of milk and milk products, meat and meat products, specific hygienic and sanitary practices to be followed by food business operators engaged in catering/ food service management.	10
III	Food safety standards of packaging and labeling regulations, 2011-Short title and commencement, definition, registration, packaging - general requirements, product specific requirements, labeling - manner of declaration, specific requirements and restriction on manner of labeling, restriction on advertisement, exemption from labeling requirement, notice of addition, admixture or deficiency in food.	8
IV	Food safety standards of food product standards and food additives regulations 2011-Short title, commencement, definition and regulation of dairy products and analogues, fats, oils and fat emulsions, fruits and vegetable products, nuts and raisins, cereal and cereal products, bakery products, meat and meat products, fish and fish products, sweet and confectionery, sweetening agents, salt, spices, condiments and related products, common salt, beverages- alcoholic and non-alcoholic, irradiation of foods, food additives and other food products.	9
V	Food safety standards of prohibition and restriction sales regulations 2011- title, commencement, definitions, prohibition and restriction of sales – sale of certain admixtures prohibited, restriction on the use of certain ingredients, prohibition	9

and restriction on sale of certain products. Food safety and standards of contaminants, toxins and residues regulation 2011- short title, commencement and definition of metal contaminants, crop contaminates and naturally occurring toxic substances, residues, antibiotic another pharmacologically active substances. Food safety standards of laboratory and sample analysis, 2011- short title, commencement and definition of notified laboratories to import, referral laboratories, procedure for sampling.
--

Text Book

1. Gazette of Food Safety and Standards Act, (2006) Food Safety regulations and food safety management. Food Safety and Standards Authority of India. New Delhi
2. The training manual for Food Safety Regulators. (2011) Vol.III, Food Safety regulations and food safety management. Food Safety and Standards Authority of India. New Delhi.
3. Food Safety and Standards Act, 2006 --- Commercial Law Publications, New Delhi
4. The Food Safety and Standards Act, 2006 (Along with Rules & Regulations) --- Commercial Law Publications, New Delhi

Subject Code No.: DFS -122	Subject Title: Food Safety Auditing
Teaching Scheme:	Theory Examination (Duration): 3 hrs
Theory: 3 hrs/week	Theory Examination (Marks): 80 Marks
Credits: 03	Class Test: 20 Marks

Course Objective: The students will learn procedures of food safety auditing in food establishments.		
Course Outcome: The students will capable to implement auditing and inspection of food safety for various food establishments.		
Unit	Course Content	Periods
I	Food surveillance: International and national practices, procedure and protocols, food alerts, traceability and food product recall. Risk analysis: risk assessment, management and communication. Food standards and Specification: need for auditing, increasing importance of HACCP based Codex Standards (GATT).	12
II	Export and import of food in India: Introduction, import and export policies, FDA import policy, export-import policy, export control systems. Import intelligence and alert systems, packaging and labeling, specifications and certifications. case studies and judicial pronouncements, procedure for investigations and filing of cases by food safety regulator as per FSS act.	12
III	Inspection of food establishments, manufacturing units: Food regulatory enforcement and compliance through inspection. Inspectional requirements for food business operators: general inspection procedures, biological inspection of establishments.	12

IV	Special establishment inspection part I: Processing of fruits and vegetables, bakery products, milk and milk products, meat and meat products, fish and fish products and chocolate and cocoa	12
V	Special establishment inspection part II: Candy and chocolate processing units, fats and oil processing units, frozen food establishments, food canning plants, beverage industry, retail meat shops, food ware houses and food service distribution	12

Text Books

1. The training manual for Food Safety Regulators. (2011) Vol.III, Food Safety regulations and food safety management. Food Safety and Standards Authority of India. New Delhi.
2. Foreign Trade Policy (27th August 2009 to 31st March 2014), Department of Commerce, Ministry of Commerce and Industry, Government of India
3. The Food Safety and Standards Act, 2006 (Along with Rules & Regulations) --- Commercial Law Publications, New Delhi
4. P. K. Das, Food Safety and Standards Act, 2006
5. Mike Dillon and Chris Griffith (2001) Auditing in the Food Industry (From Safety and Quality to Environmental and Other Audits), Woodhead Publishing Limited.

Subject Code No.: DFS -123	Subject Title: Major Project
Teaching Scheme:	Examination (Duration): 8 hrs
Practical: 20 hrs/week	Practical Examination: 125 Marks
Credits: 10	Teachers Assessment: 125 Marks

Course Objective:

The student will be explored to the project report preparation according to food industry sectors.

Course Outcome:

The student will learn how to implement food safety plan in various sectors of food industry.

Course Content

Project work in a food industry/Academic/Research organization/Food Laboratories on one of the following areas:

1. Food safety regulation, working with the enforcement agency.
2. Food safety in manufacturing sector, in a food processing industry.
3. Food safety in retail sector, in a food retailing company.
4. Food safety in catering sector, in a catering organization.
5. Food safety auditing- working with a food safety auditing company.

Candidates will be trained in the selected topics in any of the five areas in an industry or a company or relevant organization/institution and will submit a project report at the end of the semester which will be evaluated through presentation and viva voce.

Subject Code No.: DFS-124	Subject Title: Lab - Food Safety Auditing
Teaching Scheme:	Practical Examination (Duration): 4 hrs
Practical: 4 hrs/week	Practical Examination (Marks): 50
Credits: 2	Teachers Assessment: 50 marks

Auditing of a selected food industry / establishment and submission of report

1. Data collection on the quality of raw materials
2. Date collection on the processing parameters and documentation
3. Data processing
4. Preparation of model
5. Validation of model
6. Making recommendation to the industry
7. Comparative analysis of similar establishments
8. Submission of report

Subject Code No.: DFS-125	Subject Title: Seminar
Teaching Scheme:	Practical Examination (Duration): 2 hrs
Practical: 4 hrs/week	Practical Examination (Marks): --
Credits: 2	Teachers Assessment: 50

Seminar on Technical Topic of Food Safety and Quality shall be delivered by individual student. The Seminar topic shall be decided by respective faculty member. Students will be responsible for collection of necessary information, preparation of synopsis and Power Point Presentation and discussion by each student allotted topic. The evaluation of Seminar shall be done by Team of Academic members (at least 3) nominated by HOD.

Evaluation Criteria

Sr.	Particulars	Marks
1.	Understanding of Topic and Preparation of Script	10
2.	Data and Facts collection	10
3.	Presentation (Use of Audio Visual Aid)	10
4.	Presentation Skills	10
5.	Response of student towards questions raised by Audience/Team	10
	Total	50

Interpretation of Course Code:

The course offered by the Departments shall have an alphanumeric course code consisting of a string of six characters. The first three characters in a course code shall be capital letters identifying the responsible department offering the course. The next three numerical digits give the following information. The first digit specifies the year of study of the PG diploma course. Second digit stands for semester and third digit specifies the serial number of the Course.

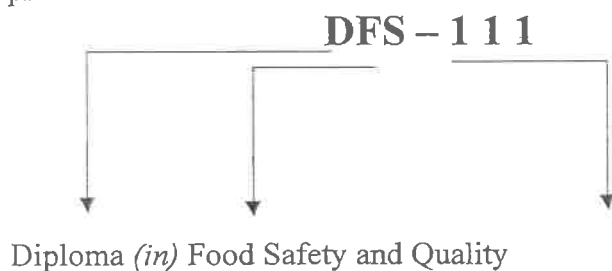
Coding System of Course/Paper Six-digit code for a Course (PG Diploma courses)

Where,

DFS stands for Diploma in Food Safety and Quality and

- 1 = Year (1)
- 2 = Semester (1/2)
- 3 = Sr. No. of course (1/2/3/4/5/6/7)

Example:



- 1 = First Year
- 1 = First Semester
- 1 = Sr. no. of Course

Annexure - I

Fees Structure

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Statement showing the tuition & other fees of Post Graduate Diploma in Food Safety and Quality (One year) under the faculty of Science and Technology on "No grant Basis".

Course	Admission Fees (Rs.)	Tuition Fees (Rs.)	Library Fees (Rs.)	Laboratory Fees (Rs.)	Medical Exam. Fees (Rs.)	Gymkhana Fees (Rs.)	Sports Fees (Rs.)	Student Welfare Fees (Rs.)	Total (Rs.)
1	2	3	4	5	6	7	8	9	10
P.G. Diploma in Food Safety and Quality	50.0	15000.0	800.0	4000.0	25.0	50.0	50.0	25.0	20000.0

Statement for details of examination for P.G. Diploma in Food Safety & Quality

Examination	How many times held in a year	Date of Commencement	Date of Application	Examination Fees (Rs.)
1	2	3	4	5
P.G. Diploma in Food Safety and Quality	Once	15 th July	15 th December	Practical - 500.0 Theory - 500.0

PROPOSED DETAILED SCHEME

FOR

POST GRADUATE DIPLOMA

In

COSMETIC TECHNOLOGY

(Effective from Academic year 2022-2023 & Onwards)



**Dr. Babasaheb Ambedkar Marathwada University,
Aurangabad-431004 (MS), India**

The rationale for introducing the course

Cosmetic Technology is a Science of making cosmetics. The cosmetic field quickly applies cutting-edge research to high-value commercial products that have a large impact on our lives and on the world's economy. Cosmetic Technologies has been at the forefront of innovative personal care manufacturing for over twenty years. The programme gives extensive knowledge of Cosmetic Formulation, Manufacturing, Analysis and Marketing. It also covers the fundamental aspects of cosmetic science that are necessary to understand material development, formulation, and the dermatological effect that result from the use of tissue products.

The outcome of the programme

Upon completion of the course, the student shall be able to know

- To conduct skill development training programmes leading to self-employment.
- To establish entrepreneurship awareness camps, entrepreneurship development programmes, hands-on training and faculty development programmes.
- To conduct research work and survey for identifying entrepreneurial opportunities especially in S and T sectors.
- To setup small scale industries for herbal drug formulations.
- They also get awareness on entrepreneurship, Intellectual Property Rights and patents.

Eligibility: M. Tech (Pharma)/ M. Tech (Oil)/ M. Tech (Perfumery)/ M. Tech (Food)/M. Sc. Organic Chemistry/ B.Tech (Cosmetic Technology)/B.Tech (Pharma)/ B. Tech (Oil)/B.Tech (Food)/B. Pharma/B Tech (Chem)/B.Sc. in Life Sciences and Equivalent Course in any other Graduation

Intake capacity : 20 Students

Course Fees: Rs.20, 000/- per candidate/annum

OBE Curriculum for PG Diploma in Cosmetic Technology Course

Semester – I

Sr	Course code	Course Title	Hours per Week				Evaluation Scheme						Credits	Duration of Theory Examination
			L	T	P	Total	CT	TA	PR	ESE	Grand Total			
1	DCT-111	Chemistry of Cosmetic Ingredients	03	01	-	04	20	-	-	80	100	4	3 Hours	
2	DCT-112	Cosmetic Technology I	03	01	-	04	20	-	-	80	100	4	3 Hours	
3	DCT-113	Formulation and Development I	03	-	-	03	20	-	-	80	100	3	3 Hours	
4	DCT-114	Analysis of Cosmetics	03	-	-	03	20	-	-	80	100	3	3 Hours	
5	DCT-115	Cosmetic Packaging Technology	02	-	-	02	10	-	-	40	50	2	2 Hours	
6	CTL-121	Cosmetic Formulation	-	-	04	04	-	50	-	-	100	2	4 Hours	
7	CTL-122	Herbal Cosmetics	-	-	04	04	-	50	-	-	100	2	4 Hours	
Total of Semester - I			14	02	08	24	90	100	100	360	650	20		

Number of the Courses (Mandatory) : 07 (credit courses)

Number of deficiency courses : -

Total Courses offered : 07

Total Course Credit Load : 24 (14+02+08)

Semester – II

Sr	Course code	Course Title	Hours per Week					Evaluation Scheme						Credits	Duration of Theory Examination
			L	T	P	Total	CT	TA	PR	ESE	Grand Total				
1	DCT-211	Cosmetic Technology II	03	01	-	04	20	-	-	80	100	4	3 Hours		
2	DCT-212	Formulation and Development II	03	-	-	03	20	-	-	80	100	3	3 Hours		
3	DCT-213	Regulatory Guidelines for Cosmetics	02	01	-	03	20	-	-	80	100	3	3 Hours		
4	CTL-221	Project dissertation and Viva Voce	-	-	20	20	-	150	150	-	300	10	4 Hours		
5	CTL-222	Seminar presentations	-	-	02	02	-	25	25	-	50	1	2 Hours		
Total of Semester - II			08	02	22	32	80	150	150	320	650	20			

Number of the Courses (Mandatory) : 05 (credit courses)

Number of deficiency courses : -

Total Courses offered : 05

Total Course Credit Load : 21 (10+01+10)

L:	Lectures per week	T:	Tutorial per week	P:	Practicals per week	TA:	Teachers Assessment	CT:	Class Test
PR:	Practical	ESE:	End Semester Examination	DCT:	Diploma in Cosmetic Technology				