

**Note:** After semester VI, there will be an industrial training for minimum 21 days. It will cover the study of a reputed chemical industry from standpoint of chemical engineering principles. The students will submit a report of the training. This particular activity is equivalent to one credit and it carries 50 marks as an External Oral Evaluation (EOE) which is included in Semester VII.

For submission of industrial training report, all the students will follow one specific format recommended by the Program Advisory Board



**DEPARTMENT OF TECHNOLOGY,  
SHIVAJI UNIVERSITY KOLHAPUR  
FINAL YEAR B.TECH**

Scheme of Teaching and Examination: Semester- VII (Chemical Technology)

Subject Code	Subject	Teaching Scheme with Credits (Hours / Week)				Examination Scheme (Marks)					
		L	T	P	Total Credits	Theory			Practical		
						Scheme	Max. marks	Min. Passing	Scheme	Max. marks	Min. Passing
CH411	Novel Separation Techniques	04	-	-	04	CIE	50	20	-	-	-
						SEE	50	20	-	-	-
CH412	Elective-I	04	-	-	04	CIE	50	20	-	-	-
						SEE	50	20	-	-	-
CH413	Process Equipment Design	04	-	-	04	CIE	50	20	-	-	-
						SEE	50	20	-	-	-
CH414	Industrial Economics and Management	04	-	-	04	CIE	50	20	-	-	-
						SEE	50	20	-	-	-
CH415	Special Chemical Technologies	04	-	-	04	CIE	50	20	-	-	-
						SEE	50	20	-	-	-
CH411L	Novel Separation Techniques Laboratory	-	-	02	01	-	-	-	EOE	50	20
CH413L	Process Equipment Design Laboratory	-	-	02	01	-	-	-	IPE	50	20
									EPE	50	20
CH416L	Comprehensive Tests		01	-	01	-	-	-	IPE	50	20
CH417L	Major Project-Phase I	-	-	02	01	-	-	-	IOE	50	20
CH418	Industrial Training	-	-	-	01	-	-	-	EOE	50	20
	<b>Total</b>	<b>20</b>	<b>01</b>	<b>06</b>	<b>25</b>	-	<b>500</b>	-	-	<b>300</b>	-

Audit Course V

HS411	Introduction to Indian Constitution	02	-	-	-	Institute Level	--	---	---	----	----
-------	-------------------------------------	----	---	---	---	-----------------	----	-----	-----	------	------

Total contact hours per week: 27+2=29 and Total Credits=25

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

CIE: Continuous Internal Evaluation  
IPE: Internal Practical Evaluation  
IOE: Internal Oral Evaluation

SEE: Semester End Examination  
EPE: External Practical Examination  
EOE: External Oral Examination

## CH411 ELECTIVE-I

**Elective –I is a pool of various courses from the Program domain. The list is as below:**

CH412.1 Petroleum Refinery Engineering, CH412.2 Biochemical Engineering, CH412.3 Polymer Chemistry, CH412.4 Introduction to Food Process Engineering, CH412.5 Green Chemistry and catalysis, CH412.6 Environmental Science and Microbiology, CH412.7 Drugs and Pharmaceutical Technology, CH412.8 Advanced Spectroscopy, CH412.9 Molecular Quantum Mechanics , CH412.10 Statistical Methods in Engineering

**Teaching Scheme: L: 4 hours/week**

**Credits: 4**

## CH417L MAJOR PROJECT (Phase I)

**Teaching Scheme: P: 2 hour/week**

**Credits: 01**

The students are required to carry out one of the following projects related to field of chemical engineering.

1. Process based Project: Manufacture of product.
2. Equipment based Project: Detailed design and fabrication of the equipment for a given capacity.
3. Experiment based Project: Experimental investigation of basic or applied research problem.
4. Industrial Problems: Any problem or project directly related to existing plants for modification of process or equipment or regarding pollution control and energy conservation under the guidance of one or more faculty members.

The activity will be undertaken at the beginning of the seventh semester in consultation with concerned guide and it must be completed in eighth semester. The project work is to be carried out by a group of students (not more than five students in a group).

The students will submit the report to the respective guide, present their work at the end of Semester. They need to cover the following aspects related to their project topic:

- Introduction to the Project topic
- Detailed Literature Survey on the topic.
- Plan/outline of the Project work.
- Submitting requirements for execution the project work.

Based on the first phase work, it is desirable that the project group will publish a review article in a reputed and relevant Journal. The project group has to deliver Project Progress presentation using LCD provided by the institute.

The project progress will be evaluated by a research and review committee of internal teachers. The committee includes concerned guide, the Program Coordinator, one senior teacher from the Program and one senior teacher from any other Program at the Department. This particular activity is assigned 50 marks as an IOE. The committee will evaluate the performance of the project group.

For submission of Project Report, the students will follow one specific format recommended by the Program Advisory Board.

## **CH418 INDUSTRIAL TRAINING**

**Credit: 1**

The industrial training after Semester VI will cover the study of a reputed chemical industry from standpoint of chemical engineering principles. It is essential for all the students to submit report of the training, in specific format as recommended by the Program Advisory Board.



**DEPARTMENT OF TECHNOLOGY,  
SHIVAJI UNIVERSITY KOLHAPUR  
FINAL YEAR B.TECH**

Scheme of Teaching and Examination: Semester- VIII (Chemical Technology)

Subject Code	Subject	Teaching Scheme with Credits (Hours / Week)				Examination Scheme (Marks)					
		L	T	P	Total	Theory			Practical		
						Scheme	Max. marks	Min. Passing	Scheme	Max. marks	Min. Passing
CH421	Elective-II (Open Elective)	04	-	-	04	CIE	50	20	-	-	-
						SEE	50	20	-	-	-
CH422	Energy resources and Utilization	04	-	-	04	CIE	50	20	-	-	-
						SEE	50	20	-	-	-
CH423	Process Modeling and Simulation	03	01	-	04	CIE	50	20	-	-	-
						SEE	50	20	-	-	-
CH424	Process Economics and Project Engineering	04	-	-	04	CIE	50	20	-	-	-
						SEE	50	20	-	-	-
CH425	Transport Phenomena	04	-	-	04	CIE	50	20	-	-	-
						SEE	50	20	-	-	-
CH423L	Process Modeling and Simulation Laboratory	-	-	02	01	-	-	-	EPE	50	20
CH424L	Piping & Instrumentation Design and Drawing	-	-	02	01	-	-	-	IOE	50	20
CH426L	Plant Design and Drawing	-	-	02	01	-	-	-	EPE	50	20
CH427L	Major Project-Phase II	-	-	04	02	-	-	-	IPE	50	20
						-	-	-	EPE	100	40
<b>Total</b>		<b>19</b>	<b>01</b>	<b>10</b>	<b>25</b>	-	<b>500</b>	-	-	<b>300</b>	-

Audit Course VI

HS422	Professional Ethics	<b>02</b>	-	-	-	Institute Level	-	-	-	-	-
-------	---------------------	-----------	---	---	---	-----------------	---	---	---	---	---

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

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

CIE: Continuous Internal Evaluation                      SEE: Semester End Examination  
 IPE: Internal Practical Evaluation (Based on Project Work)  
 EPE: External Practical Examination (Based on Project Work)  
 IOE: Internal Oral Evaluation                                      EOE: External Oral Examination

### **CH421 ELECTIVE-II (OPEN ELECTIVE)**

Elective –II is also termed as Open Elective with the motive that besides pool of the Program domain electives, the students are free choose an elective from any other Program at the institute. The pool is as below:

CH422.1 Petrochemical Technology, CH422.2. Industrial Biotechnology, CH422.3. Polymer Technology, CH422.4 Food Process Technology, CH422.5 Interfacial Science and Engineering, CH422.6 Environmental Chemistry and Biochemistry, CH422.7 Advanced Materials , CH422.8 Project Management, CH422.9 CFD applications in chemical processes, CH422.10 Open Elective (to be chosen from any of the specialized program available on the campus)

**Teaching Scheme: L: 4 hours/week**

**Credits: 4**

The interested students have to choose the open elective from any of the specialized program available on the campus. The students have to contact the concerned course teacher and attend the classes in the respective course which will be taught by the concerned teacher.

## CH427L MAJOR PROJECT (PHASE II)

**Teaching Scheme: P: 04 hours/week**

**Credits: 2**

In the second phase of the Project Work, all the project groups will carry out actual execution the work planned as stated as an outcome of the first phase in the seventh semester. They will submit the final project report in two hard bound copies along with soft copy to the guide. The guide will submit one copy to the Program office and the other copy will be owned by him/her. The report will be prepared in a standard format as provided by the Program Advisory Board.

Generally, the report will consist of problem definition, review of literature, selection of the process, computation of material and energy balances, process design of important equipments, detailed design of one of the main equipment, plant location and layout, cost estimation, economic analysis, details of experimental set up, analysis of data, results and discussion, the related pollution control, safety and marketing aspects. At the end of the project report, the conclusions and recommendations of the project work along with the bibliography in standard format will be mentioned. There may be little variation in project report writing depending on the nature of the respective project problem under investigation.

The objective of the project is to make use of the knowledge gained by the students at various stages of the B.Tech Program. This helps to judge the level of proficiency, originality and capacity for application of the knowledge attained by the students at the end of the studies.

This particular activity will be for 100 marks as an Internal Practical Evaluation (IPE). The same research and review committee will carry out the assessment of the project groups.

For External Practical Examination (EPE) carrying 100 marks, there will be a panel of at least 3 external examiners to assess the project work. The research and review committee along with the external examiners will examine each of the project groups through VIVA VOCE and physical verification of the project models if any. The students group using the LCD will demonstrate their work to all the examiners.



## Equivalence of Final Year B.Tech (Chemical Technology) Semester VII and VIII

The above detailed syllabus is a revised version of the Final Year B.Tech (Chemical Technology) Program being conducted by Shivaji University at its Technology Department. This syllabus is to be implemented from June 2019, (Academic year 2019-20). *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 of Chemical Technology at Final Year B Tech Semester VII and VIII pre-revised course under the faculty of Engineering and Technology is as follows.

### Final Year B.Tech Semester VII (Chemical Technology)

Sr.No	Final Year B.Tech(Chemical Technology) Semester VII Pre-revised syllabus	Final Year B.Tech(Chemical Technology) Semester VII Revised syllabus	Remark
1.	Advanced Separation Techniques	Novel Separation Techniques	Slightly modified the content with change in the title as well
2.	Elective –I	Elective-I	Slightly modified the content and updated the list
3.	Process Economics and Project Engineering	Industrial Economics and Management	Existing one is shifted to semester VIII and the new one is shifted from semester V
4.	Reaction Engineering – II	-	Shifted to semester VI
5.	Special Chemical Technologies-I	Special Chemical Technologies	Modified the contents with little change in title as well
6.	Advanced Separation Techniques Laboratory	Novel Separation Techniques	Slightly modified the content with change in the title
7.	Reaction Engineering – II Laboratory	-	Shifted to semester VI
8.	Plant Design and Case studies	-	Converted to practical , with title change and shifted to semester VIII
9.	Major Project-Phase I	Major Project-Phase I	Modified the content
10.	Report of Industrial Training	Industrial Training	Modified the title
11.	-	Process Equipment Design	Shifted from semester VI and modified with the title
12.	-	Process Equipment Design Laboratory	
13.	-	Comprehensive Tests	Added newly to revise subject domain studies
14.	Audit Course V Professional Ethics	-	Shifted to semester VIII
15.		Audit Course V Introduction to Indian Constitution	Shifted from semester VIII

**Final Year B.Tech Semester VIII (Chemical Technology)**

Sr.No	Final Year B.Tech(Chemical Technology) Semester VIII Pre-revised syllabus	Final Year B.Tech(Chemical Technology) Semester VIII Revised syllabus	Remark
1.	Energy Conservation in Chemical Industries	Energy resources and Utilization	Modified the contents and the title as well
2.	Elective-II	Elective-II (Open Elective)	Modified the theme and updated the list
3.	Process Modeling and Simulation	Process Modeling and Simulation	Modified the contents
4.	Special Chemical Technologies-II	-	Clubbed in only one subject and has been put in semester VII and we have introduced one new course
5.	Transport Phenomena	Transport Phenomena	Modified the contents
6.	Industrial Safety and Hazard Management	-	Shifted to semester semester V
7.	Process Modeling and Simulation Laboratory	Process Modeling and Simulation Laboratory	Modified the contents
8.	Major Project- Phase II	Major Project-Phase II	Modified the contents
9.	Audit Course VI Introduction to Constitution of India	-	Shifted to semester VII with title change.
10.	-	Process Economics and Project Engineering	Shifted from semester VII
11.	-	Piping & Instrumentation Design and Drawing	Newly introduced to imbibe practical skills.
12.	-	Plant Design and Drawing	Shifted from semester VII, modified with the title and converted to laboratory
13.	-	Audit Course VI Professional Ethics	Shifted from semester VII

Audit course have been assigned no any credits. The students will be evaluated for these courses by the concerned course in charge. There will be grade conferred to the student. The grade will be based on conversion of marks obtained out of 50. Obtaining passing grade is essential condition. Please refer to chart in the detail examination scheme. The chart shows the range of marks and the respective grade.