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REF: VTU/BGM/BoS/SEE-CH/2024-25/ 2183

DATE: 12 AUG 2024

**CIRCULAR**

Sir/ Madam,

**Subject: Semester End Evaluation Method corrected for course 21CH71-Process Equipment Design & Drawing**

**Reference:**

1. Chairperson BoS in Chemical Engineering email dated: 07.08.2024
2. The Hon'ble Vice-Chancellor's approval Dated: 12.08.2024

This is a reference to the subject mentioned above. The Chairperson of the Board of Studies in Chemical Engineering has corrected a typographical error in the semester-end evaluation (SEE) method of course **21CH71: Process Equipment Design and Drawing**.

Attached to this circular is a copy of the syllabus, including the updated semester-end evaluation method.

All principals of engineering colleges offering a chemical engineering program are requested to inform all relevant parties about the updated content of the circular.

**Encl:** As mentioned above.

Sd/-

REGISTRAR

To,

**All the Principals of Engineering Colleges under the ambit of the University**

**Copy to**

- The Hon'ble Vice-Chancellor through the secretary to VC for information
- The Registrar (Evaluation) for information and needful
- The Director, ITI,SMU,VTU Belagavi for information and needful also request to upload the circular on the University website
- The Special Officer QPDS section of VTU Belagavi for information and needful
- Office copy

12/08/24  
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<b>Process Equipment Design &amp; Drawing</b>			
Course Code	<b>21CH71</b>	CIE Marks	50
Teaching Hours/Week (L:T:P:S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	3	Exam Hours	4
<p><b>Course objectives:</b></p> <p>The students will be able to</p> <ul style="list-style-type: none"> <li>• Understand advances and types in the design of heat and mass transfer equipment and its accessories.</li> <li>• Develop modifications based on design.</li> </ul>			
<p><b>Note:</b></p> <p>Detailed chemical engineering process design of the following equipment should be studied. Standard code books are to be used. The detailed proportionate drawings shall include sectional front view, full top/side view depending on equipment and major components.</p> <p><b>Class work:</b> Students are to design the equipment. They shall also be trained to draw free hand proportionate sketches.</p> <p><b>Final Examination:</b> Students have to answer any one of the two questions given in the examination. After completing the design, free hand proportionate sketches are to be drawn as required.</p>			
<p><b>Teaching-Learning Process (General Instructions)</b></p> <p>These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.</p> <ul style="list-style-type: none"> <li>• An appeal is made to the teachers to use alternative effective teaching methodology to inculcate an interest in the subject and its applications to solve societal &amp; industrial problems.</li> <li>• Efforts may be made to use MOOC's, videos, recorded contents, presentations to induce curiosity, better understanding, and also higher levels of learning.</li> <li>• Activities to promote interest may be incorporated wherever possible</li> </ul>			
<b>Content</b>			
<ol style="list-style-type: none"> <li>1. Shell and Tube Heat exchanger</li> <li>2. Condenser – Horizontal</li> <li>3. Condenser – Vertical</li> <li>4. Evaporator – Single effect</li> <li>5. Sieve Tray Distillation Column</li> <li>6. Packed Bed Absorption Column</li> <li>7. Rotary Drier</li> </ol>			
<b>Teaching-Learning Process</b>	The teaching learning process along with the conventional teaching methodology may involve activities for the whole-class, or structured group work, or guided learning and individual activity.		
<p><b>Course outcomes (Course Skill Set)</b></p> <p>At the end of the course the student will be able to :</p> <ol style="list-style-type: none"> <li>1. Design and analyse the heat transfer equipment without phase change</li> <li>2. Design Mass transfer equipment with tray column</li> <li>3. Design Mass transfer equipment with packed columns</li> <li>4. Design Combined Heat and Mass Transfer equipment</li> </ol>			

### Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures not less than 35% ( 18 Marks out of 50)in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

#### Continuous Internal Evaluation:

Two Unit Tests each of **30 Marks (duration 04 hour)**

1. The first test is at the end of 40-50% of the syllabus coverage.
2. The second test is at the end of 85-90% of the syllabus coverage.
3. Two assignments each of **10 Marks**
4. First assignment at the end of 4<sup>th</sup> week of the semester
5. Second assignment at the end of 9<sup>th</sup> week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

6. At the end of the 13<sup>th</sup> week of the semester

The sum of two tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(To have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

**CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

#### Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (duration 04 hours)

1. **The question paper will have two questions. Each question is set for 100 marks.**
2. **The students have to answer any one full question.**
3. **Marks scored out of 100 by the student shall be proportionally scaled down to 50 Marks**

#### Suggested Learning Resources:

##### Books

1. Process Equipment Design - M. V. Joshi, 3rd edn., Macmillan & Co. India, Delhi, 1998.
2. Process Equipment Design - Vessel Design, Brownell & Young, John Wiley, 1959.
3. Process Design of Equipment - Vol 1, S. D. Dawande, 3<sup>rd</sup>edn, Central Techno Publications. 2003.

4. Chemical Engineers Handbook, Perry & Green, 8<sup>th</sup>edn, McGraw Hill, 1997.
5. Pressure Vessel Code - IS 2825, 4503, IS Code, B.I.S., New Delhi, 1969.
6. Flow of Fluids through Valves, Fittings & Pipes, Crane Amazon, 2006.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**B.E. in Chemical Engineering**  
**Scheme of Teaching and Examinations 2021**  
**Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2021 - 22)**

## Swappable VII and VIII SEMESTER

## VII SEMESTER

Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
				Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	T	P	S					
1	PCC 21CH71	Process Equipment Design & Drawing	CH	3	0	0	0	4	50	50	100	3
2	PCC 21CH72	Biochemical Engineering	CH	2	0	0	0	2	50	50	100	2
3	PEC 21CH73x	Professional elective Course-II	CH	3	0	0	0	3	50	50	100	3
4	PEC 21CH74x	Professional elective Course-III	CH	3	0	0	0	3	50	50	100	3
5	OEC 21CH75x	Open elective Course-II	Concerned Department	3	0	0	0	3	50	50	100	3
6	Project 21CH76	Project work		Two contact hours /week for interaction between the faculty and students.				3	100	100	200	10
<b>Total</b>									<b>350</b>	<b>350</b>	<b>700</b>	<b>24</b>

## VIII SEMESTER

Sl. No	Course and Course Code	Course Title	Teaching Department	Teaching Hours /Week				Examination				Credits	
				Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks	Total Marks		
				L	T	P	S						
1	Seminar 21XX81	Technical Seminar		One contact hour /week for interaction between the faculty and students.				--	100	--	100	01	
2	INT 21INT82	Research Internship/ Industry Internship		Two contact hours /week for interaction between the faculty and students.				03 (Batch wise)	100	100	200	15	
3	NCMC	21NS83	National Service Scheme (NSS)	NSS	Completed during the intervening period of III semester to VIII semester.				--	50	50	100	0
		21PE83	Physical Education (PE) (Sports and Athletics)	PE									
		21YO83	Yoga	Yoga									
<b>Total</b>									<b>250</b>	<b>150</b>	<b>400</b>	<b>16</b>	

## Professional Elective - II

21CH731	Instrumental Methods of Analysis	21CH734	Novel Separation Techniques
21CH732	Oils and Fats Technology	21CH735	Chemical Plant Utilities and Safety
21CH733	Pharmaceutical Technology		

## Professional Elective - III

21CH741	Chemical Process Integration	21CH744	Pilot Plant and Scale Up Studies
21CH742	Transport Phenomena	21CH745	Process and Industrial Safety
21CH743	Pulp and Paper Technology		