

Date- 24/06/2019

Hindustan College of Science & Technology

(Farah, Mathura)

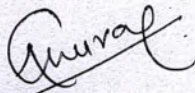
Chemical Engineering Department

Notice

This is for information to all the students of 2nd, 3rd year that the Value Added Course (**Process Equipment Design & Solid Waste Management**) shall begin from 13th of July 2019.

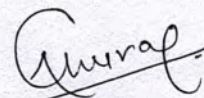
All the students of 2nd, 3rd year are directed to register themselves and fill up the registration form in the departments before start of the regular classes for the above courses.

The registration can be done from 2nd July 2019 up to 06th July 2019.

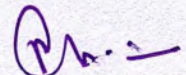


Mr. Anurag Bajpai

Head, Department of Chemical Engineering



Head
Department of Chemical Engg.
Hindustan College of Science & Technology
Farah, Mathura



Director
Hindustan College of
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FARAH (MATHURA)



HINDUSTAN COLLEGE OF SCIENCE & TECHNOLOGY,
FARAH - MATHURA

DEPARTMENT OF CHEMICAL ENGINEERING



Value Added Course
VAC-1701-Process Equipment Design

13th July '2019 – 9th Nov 2019 - Every Saturday: 3:10 PM – 4:50 PM



By

Mr. Anurag Bajpai
HOD -Chemical Engineering

Registration Dates
2nd July 2019 – 06th July 2019

For Registration: Please contact
Mr. Raj Kumar, Office Staff, Department of Chemical Engineering

Anurag
Head
Department of Chemical Engg.
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Raj Kumar
Director
Hindustan College of
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HINDUSTAN COLLEGE OF SCIENCE & TECHNOLOGY, FARAH -MATHURA



DEPARTMENT OF CHEMICAL ENGINEERING

Value Added Course

VAC -1701 - Process Equipment Design

13th July '2019 – 9th Nov 2019 - Every Saturday: 3:10 PM – 4:50 PM

Course Objectives

The main objective of this value added course are as follows:

1. Plan logistics for waste collection and disposal .
2. Formulate strategies for segregation of waste and waste reduction.
3. Plan appropriate recycles facility for heterogeneous wastes.
- 4 Plan and design waste collection systems.

Course Syllabus

Units	Details	Course Out comes
1	Introduction to waste management Logistics, importance, methods of logistics, human components, technological components- waste handling equipment and technology, and managerial goals, steps in waste management logistics	CO1
2	Waste collection system and organization Environmental aspects of waste collection, role of public authority and private sector in waste collection, organizing collection of residential waste, fee schemes, public awareness programs	CO2
3	Source segregation and collection source-segregated waste, Purpose of source segregation, segregation criteria and guidance, segregation potential and efficiencies, systems for collecting segregated fraction	CO3
4	Waste transfer stations Waste delivery, waste transfer, transportation of the reloaded waste, siting and Design of waste transfer station, economical considerations, recycling solid wastes, materials recovery facilities	CO4

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DEPARTMENT OF CHEMICAL ENGINEERING

Value Added Course

VAC-1701 - Process Equipment Design

13th July '2019 – 9th Nov 2019 - Every Saturday: 3:10 PM – 4:50 PM

Course Outcomes

CO-PO Mappings

- CO1 Plan logistics for waste collection and disposal
Formulate strategies for segregation of waste and waste reduction.
- CO2
- CO3 Plan appropriate recycles facility for heterogeneous wastes.
- CO4 Plan and design waste collection systems.

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3											2		
CO2	2	3											2		
CO3	2			3						2	2	2	2		
CO4			2	3						2	2	2			3
Average	2	3	2	3						2	2	2	2		3

Evaluation Criteria: 1. Evaluation of Practical assignments, Group project, Viva/Quiz

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HINDUSTAN COLLEGE OF SCIENCE & TECHNOLOGY, FARAH -MATHURA
DEPARTMENT OF CHEMICAL ENGINEERING

Value Added Course
VAC-1701 - Process Equipment Design



Program Schedule

13th July '2019 – 9th Nov 2019 - Every Saturday: 3:10 PM – 4:50 PM

Session	Date	Time	No of Lectures	Session Topic	Resource Person
1	13-07-2019	3:10 PM – 4:50 PM	2	Topic 1: Design project procedure, design information from the literature	Mr. Anurag Bajpai
2	20-07-2019	3:10 PM – 4:50 PM	2	Topic 2: Flow diagrams, preliminary design	Mr. Anurag Bajpai
3	27-07-2019	3:10 PM – 4:50 PM	2	Topic 3: Comparison of different processes, equipment design	Mr. Anurag Bajpai
4	03-08-2019	3:10 PM – 4:50 PM	2	Topic 4: Scale-up in design, Materials of construction	Mr. Anurag Bajpai
5	10-08-2019	3:10 PM – 4:50 PM	2	Topic 5: Selection of materials, fabrication of equipment	Mr. Anurag Bajpai
6	17-08-2019	3:10 PM – 4:50 PM	2	Topic 6: Pressure vessels – calculation of thickness of cylindrical and spherical shells	Mr. Anurag Bajpai
7	24-08-2019	3:10 PM – 4:50 PM	2	Topic 7: Subjected to internal pressure, heads or covers	Mr. Anurag Bajpai
8	31-08-2019	3:10 PM – 4:50 PM	2	Topic 8: Storage vessels – storage of nonvolatile liquids, storage of volatile liquids	Mr. Anurag Bajpai
9	07-09-2019	3:10 PM – 4:50 PM	2	Topic 9: Storage of gases. Supports for vessels – bracket or lug supports	Mr. Anurag Bajpai
10	14-09-2019	3:10 PM – 4:50 PM	2	Topic 10: Leg supports, skirt supports, saddle supports	Mr. Anurag Bajpai
11	21-09-2019	3:10 PM – 4:50 PM	2	Topic 11: Design of double pipe heat exchangers	Mr. Anurag Bajpai
12	28-09-2019	3:10 PM – 4:50 PM	2	Topic 12: Shell and tube heat exchangers (1-2,2-4), optimum design and heat recovery	Mr. Anurag Bajpai
13	05-10-2019	3:10 PM – 4:50 PM	2	Topic 13: Selection of suitable heat exchanger	Mr. Anurag Bajpai
14	12-10-2019	3:10 PM – 4:50 PM	2	Topic 14: Design of single and multiple effect evaporators without boiling point elevation	Mr. Anurag Bajpai
15	19-10-2019	3:10 PM – 4:50 PM	2	Topic 15: Finite-stage contactors- bubble cap tray, sieve tray and valve tray units	Mr. Anurag Bajpai
16	26-10-2019	3:10 PM – 4:50 PM	2	Topic 16: Maximum allowable vapor velocities, plate and column efficiency, other design factors	Mr. Anurag Bajpai
17	02-11-2019	3:10 PM – 4:50 PM	2	Topic 17: Continuous contactors – types of packing, liquid distribution, pressure drop	Mr. Anurag Bajpai
18	09-11-2019	3:10 PM – 4:50 PM	2	Topic 18: Packing efficiencies. Relative merits of plate and packed towers, selection of contacting equipment	Mr. Anurag Bajpai
Total Number of Hours covered			36 (30 Hours)		

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 Department of Chemical Engg.
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Value added course-1

Process Equipment Design (VAC-1701)

UNIT-I

INTRODUCTION TO PLANT DESIGN.

PROCESS DESIGN DEVELOPMENT:

Design project procedure, design information from the literature, flow diagrams, preliminary design, comparison of different processes, equipment design, scale-up in design. Materials of construction, selection of materials, fabrication of equipment.

Learning Outcomes: After the completion of the Unit I, the student will be able to

1. Discuss the preliminary design of various processes
2. Identify various materials for fabrication of equipment
3. Explain the scale up in design

UNIT-II

MECHANICAL DESIGN OF PROCESS EQUIPMENT:

Pressure vessels – calculation of thickness of cylindrical and spherical shells subjected to internal pressure, heads or covers.

Storage vessels – storage of nonvolatile liquids, storage of volatile liquids, storage of gases. Supports for vessels – bracket or lug supports, leg supports, skirt supports, saddle supports.

Learning Outcomes: After the completion of the Unit II, the student will be able to

1. Identify various stresses acting on the walls of pressure vessels
2. Estimate the thickness of thin walled pressure vessels
3. Calculate the thickness of heads of pressure vessels

UNIT-III

HEAT TRANSFER EQUIPMENT DESIGN:

Design of double pipe heat exchangers, Shell and tube heat exchangers (1-2,2-4), optimum design and heat recovery, selection of suitable heat exchanger.

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Design of single and multiple effect evaporators without boiling point elevation.

Learning Outcomes: After the completion of the Unit III, the student will be able to

1. Identify the purpose of various heat exchangers
2. Estimate the overall heat transfer coefficient for heat exchangers
3. Calculate the area of multiple effect evaporator .

UNIT-IV

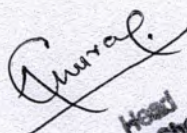
MASS TRANSFER EQUIPMENT DESIGN:

Finite-stage contactors- bubble cap tray, sieve tray and valve tray units, maximum allowable vapor velocities, plate and column efficiency, other design factors.

Continuous contactors – types of packing, liquid distribution, pressure drop, packing efficiencies. Relative merits of plate and packed towers, selection of contacting equipment.

Learning Outcomes: After the completion of the Unit IV, the student will be able to

1. Select the suitable contactor for a given mass transfer operation
2. Design a packed bed
3. Evaluate the design parameters of tray tower


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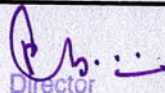

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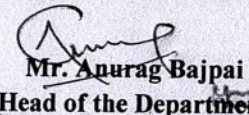
Department Name: CHEMICAL ENGINEERING

CLASS TIME TABLE FOR ODD SEMESTER 2019-20

SESSION:	2019-20		W.E.F :	7/24/2019		CLASS TEACHER:	Mr.Chandra Pal Singh		
YEAR/SEM-SEC:	III Year/ (V Sem)		ROOM.NO :	504-B		COUNSELLORS :	Mr. Sandeep kr. Verma		
Time / Day	I	II	III	IV	V	VI	VII	VIII	
	10:10 TO 11:00	11:00 TO 11:50	11:50 TO 12:40	12:40 TO 01:30	01:30 TO 02:20	02:20 TO 03:10	03:10 TO 04:00	04:00 TO 04:50	
MONDAY	CRE-I	OT	Soft Computing Lab		LUNCH	Chemical Technology Lab		Mana.Econ.	
	AB	SA	SA			CPS		AP	
	504-B	504-B	404			501		504-B	
TUESDAY	CRE-I	CT	Sociology	Mana.Econ.		OT Tute	MT-II	CT	
	AB	CPS	AG	AP		SA	SKV	CPS	
	504-B	504-B	504-B	504-B		504-B	504-B	504-B	
WEDNESDAY	CT	MT-II	Sociology	CRE-I		PDP		MT-II Tute	
	CPS	SKV	AG	AB				SKV	
	504-B	504-B	504-B	504-B				504-B	
THURSDAY	CRE-I	MT-II	OT	Mana.Econ.		CRE LAB			
	AB	SKV	SA	AP	AB				
	504-B	504-B	504-B	504-B	502				
FRIDAY	Mana.Econ.	OT	Sociology	CT	MTO-II LAB		MT-II		
	AP	SA	AG	CPS	SKV		SKV		
	504-B	504-B	504-B	504-B	502-A		504-B		
SATURDAY	OT	PDP		CRE-I Tute	VAC-1701				
	SA			AB					
	504-B			504-B					
Name of the Subject			Subject Code	Name of the Faculty		Total No. of Lect./Tut./Practical			
					Lect.	Tut.	Pract.		
Managerial Economics			RAS501	Mr. Anand Poras(AP)-9412990385	4	0	0		
Sociology			RAS502	Dr. Archana Gautam(AG)	4	0	0		
Chemical Reaction Engineering -I			RCH501	Mr. Anurag Bajpai(AB)	4	1	0		
Mass Transfer-II			RCH502	Mr. Sandeep Kumar Verma(SKV)	4	1	0		
Optimization Techniques			RCH052	Dr. Salim Ahmed(SA)	4	1	0		
Chemical Technology			RCH503	Mr. Chandra Pal Singh(CPS)	4	0	0		
CRE Lab			RCH551	Mr. Anurag Bajpai/Mr. Asim Shukla	0	0	3		
MT Lab-II LAB			RCH552	Mr. Sandeep Kumar Verma/Mr. Venktesh	0	0	2		
CT LAB			RCH553	Mr. Chandra Pal Singh/Mr. Asim Shukla	0	0	2		
Soft Computing Lab			RCH554	Dr. Salim Ahmed(SA)	0	0	2		


Director

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Mr. Anurag Bajpai
Head of the Department

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Hindustan College of Science & Technology

Department of Chemical Engineering

Value Added Course - Registration Form

Process Equipment Design

Session 2019-20

From 13th July, 2019 to 09th Nov, 2019

Sr. No.	Roll No.	Name	Department	Semester	Signature of Student
1	1706451001	ANKIT KASHYAP	Chemical	V	Ankit
2	1706451003	CHETAN SHARMA	Chemical	V	Chetan
3	1706451004	DEVESH GUPTA	Chemical	V	Devesh
4	1706451005	KM MANSI SHARMA	Chemical	V	Km. Mansi
5	1706451006	RAJESH KUMAR RAJPUT	Chemical	V	Raj Rajput
6	1706451008	RAM PRASAD	Chemical	V	Ram
7	1706451009	ROMIL CHAUDHARY	Chemical	V	Romil
8	1706451010	SHOBHITA SHARMA	Chemical	V	Shobhita
9	1706451011	SUMEDHA SHARMA	Chemical	V	Sumedha
10	1806451902	GAURAV KUMAR GUPTA	Chemical	V	Gaurav
11	1806451905	VINAY KUMAR RANA	Chemical	V	Vinay
12	1806451903	PRAVEEN YADAV	Chemical	V	Praveen
13	1806451906	SUMIT KUMAR GUPTA	Chemical	V	Sumit
14	1806451901	BHUVENESH PAL	Chemical	V	B.
15	1806451904	SIDDHANT SRIVASTAVA	Chemical	V	Siddhant

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Department of Chemical Engineering

Value Added Course - Registration Form

Process Equipment Design

Session 2019-20 (Odd Sem)

session wise Attendance Sheet

Sl. No.	Roll No.	Name	SEM	Signature of the Student by Session																	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1706451001	ANKIT KASHYAP	V	Ankit	Ankit	Ankit	Ankit	A	Ankit	Ankit	Ankit	Ankit	Ankit	A	A	Ankit	Ankit	Ankit	A	Ankit	Ankit
2	1706451003	CHETAN SHARMA	V	Ca	Ca	Ca	Ca	Ca	A	Ca	Ca	A	Ca	Ca	Ca	Ca	Ca	A	Ca	Ca	Ca
3	1706451004	DEVESH GUPTA	V	Devesh	Devesh	Devesh	A	Devesh	Devesh	Devesh	Devesh	Devesh	Devesh	A	Devesh	A	Devesh	Devesh	Devesh	Devesh	Devesh
4	1706451005	KM MANSI SHARMA	V	Mansi	Mansi	Mansi	A	Mansi	Mansi	Mansi	Mansi	Mansi	Mansi	A	Mansi	Mansi	Mansi	Mansi	Mansi	Mansi	Mansi
5	1706451006	RAJESH KUMAR RAJPUT	V	Rx Rajput	Rx Rajput	A	Rx Rajput	Rx Rajput	Rx Rajput	Rx Rajput	A	Rx Rajput	A	Rx Rajput	Rx Rajput	Rx Rajput	A	Rx Rajput	Rx Rajput	Rx Rajput	Rx Rajput
6	1706451008	RAM PRASAD	V	Rami	A	Rami	Rami	Rami	Rami	Rami	Rami	A	Rami	Rami	Rami	A	Rami	A	Rami	Rami	Rami
7	1706451009	ROMIL CHAUDHARY	V	Romil	Romil	Romil	A	Romil	Romil	Romil	Romil	A	Romil	Romil	Romil	A	Romil	Romil	Romil	Romil	Romil
8	1706451010	SHOBHITA SHARMA	V	Sobha	Sobha	Sobha	Sobha	Sobha	A	Sobha	Sobha	Sobha	Sobha	A	Sobha	Sobha	Sobha	Sobha	A	Sobha	Sobha
9	1706451011	SUMEDHA SHARMA	V	Sumedha	Sumedha	Sumedha	Sumedha	Sumedha	Sumedha	Sumedha	Sumedha	Sumedha	A	Sumedha	Sumedha	Sumedha	Sumedha	Sumedha	Sumedha	Sumedha	Sumedha
10	1806451902	GAURAV KUMAR GUPTA	V	Gaurav	Gaurav	A	Gaurav	Gaurav	Gaurav	Gaurav	A	Gaurav	Gaurav	Gaurav	Gaurav	Gaurav	A	Gaurav	Gaurav	Gaurav	Gaurav
11	1806451905	VINAY KUMAR RANA	V	A	Vinay	Vinay	Vinay	A	Vinay	Vinay	Vinay	Vinay	Vinay	A	Vinay	Vinay	Vinay	Vinay	Vinay	Vinay	Vinay
12	1806451903	PRAVEEN YADAV	V	A	Praveen	Praveen	Praveen	A	Praveen	Praveen	Praveen	A	Praveen	Praveen	A	Praveen	Praveen	Praveen	Praveen	Praveen	Praveen
13	1806451906	SUMIT KUMAR GUPTA	V	sumit	sumit	sumit	sumit	A	sumit	sumit	A	sumit	sumit	sumit	A	sumit	sumit	sumit	A	sumit	sumit
14	1806451901	BHUVENESH PAL	V	A	B	B	B	B	A	B	B	B	B	B	A	B	A	B	B	B	B
15	1806451904	SIDDHANT SRIVASTAVA	V	S	S	A	S	S	S	S	S	A	S	S	S	A	S	S	S	S	S

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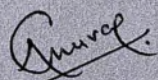
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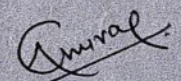


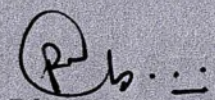
Certificate of Completion

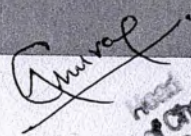
DEPARTMENT OF CHEMICAL ENGINEERING
Academic Session 2019-20
1706451010

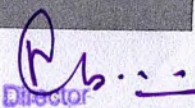
This is to certify that Ms. SHOBHITA SHARMA, Roll No: 1706451010 of Course: B. Tech. Chemical Engineering, V semester has successfully completed 30 hours Value Added Course titled "Process Equipment Design" (Course code: VAC-1701).


Course Coordinator


Head of Department


Director, HCST


Head of Department
Department of Chemical Engineering
Hindustan College of Science & Technology
Farah Mathura


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