I

BITS Pilani

CHE F341
Chemical Engineering Laboratory-II

Course No. : **CHE F341**

Course Title : **CHEMICAL ENGINEERING LABORATORY – II**

Instructors Dr. Manjuri Kumar, Dr. Asima Shaukat, Dr. Pradeep Kumar, Dr. Richa Singhal, , Dr. **Vivek R** (*Instructor incharge*)

CEL 1: COMSOL, Heat transfer, Fluid Mechanics and Engineering chemistry

CEL 2: Process control, Chemical reaction engineering, Separation process I & II

CHEMICAL ENGINEERING LAB – II

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Process control

1. Interacting & Non interacting/ Flapper nozzle
2. Valve characteristics
3. Temperature control
4. Universal Process cont
5. I & II order systems
6. Pressure control
7. Multi-Process Trainer

Chemical reaction Engineering

1. Coil type PFR
2. Cascade CSTR
3. RTD studies

Separation Process I

1. Diffusion
2. Packed bed ditillation
3. Packed Bed absorption
4. Mass.tran W& W/O chemical reaction
5. VLE

Separation Process II

1. Crushers
2. Vaucum dryer
3. Plate & Frame filter Press + Froth Floatation
4. Rotary vacuum filter
5. Forced draft tray dryer + Basket centrifuge

20 experiments

Teaching Assistants

CHEMICAL ENGINEERING LAB – II

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Process control

1. Puneeth T
2. Anegondi Nateriachyuth
3. K Aashish Moses
4. Partha Sarathikalita
5. Lubna Muzamilrehman
6. Shriram
7. Ashwin Y
8. Pruthivi G
9. Shravani Kharote
10. Ishita
11. Pagadala Saipavan Kalyan
12. Anmol Shahi
13. M Dileep, Vadapalli Sreekavya
14. Rohit Thakran, Vinoth

Dr. Pradeep Kumar

Chemical reaction Engineering

15. Parsekar Sidhali Uday
16. Dolly Saxena
17. Neela Gayathri G
18. Akshat Khandelwaal
19. Anupam Mukherjee
20. Simar Singh

Dr. Vivek Rangarajan

Separation Process I

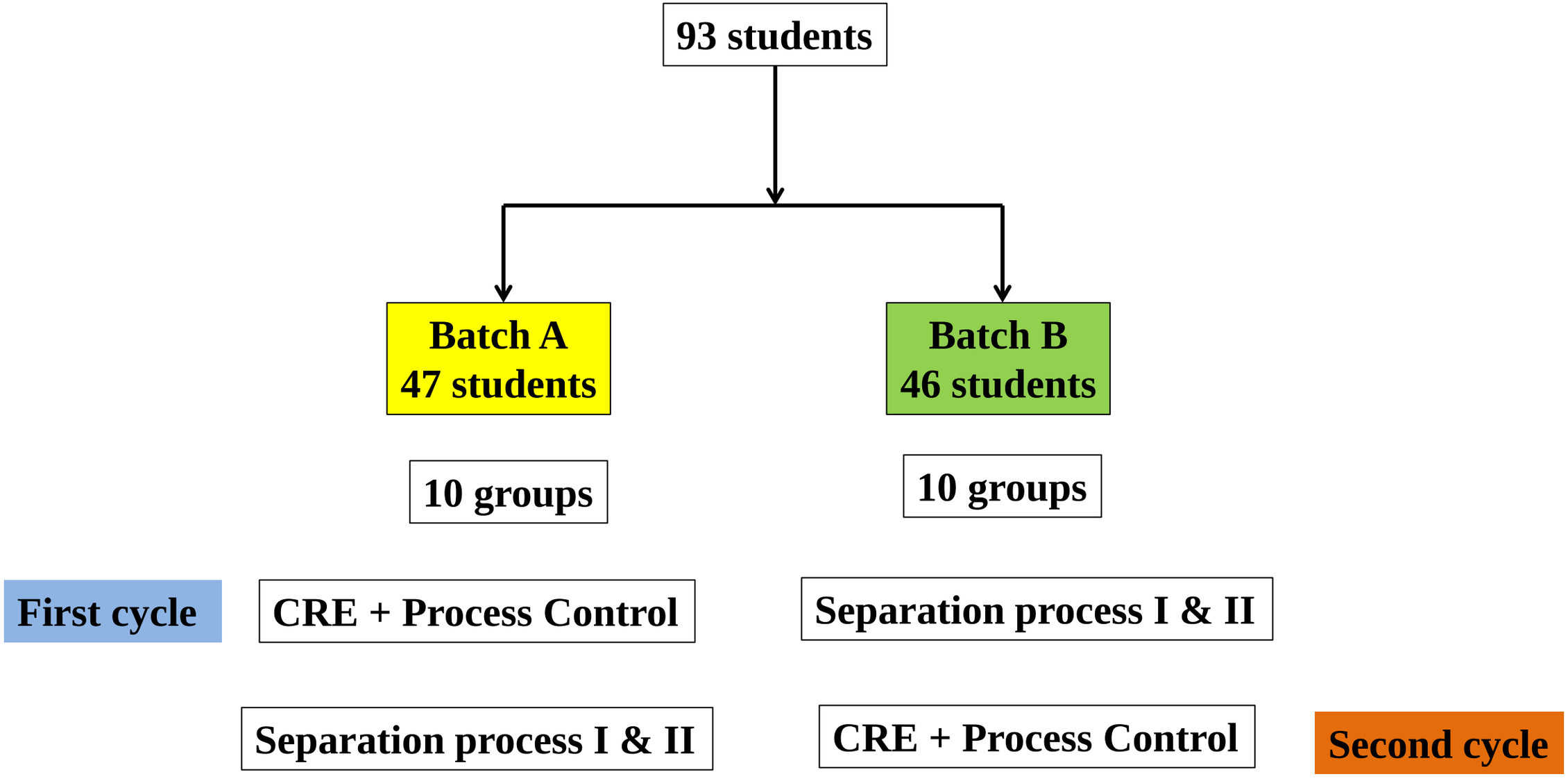
21. Kishlay Bhaskar
22. V Kaarthick Raja
23. Kadu Kavita Haribhau
24. Jasneet Kaur Pala
25. Anjali Adnyan Meshram
26. Amina F
27. Mohd Mubashshir
28. Priyanka
29. Pragya Singh
30. Akanksha M

Dr. Richa Singhal

Separation Process II

31. Rishi Rajtripathi
32. Kumar Vishwaranjan
33. Anushri
34. Akanksha Gavendra
35. AkshayNarayangaikwad
36. Satyam Shree
37. Chandresh Kr Dwivedi
38. Gnanakumar Barani

Dr. Manjuri Kumar
Dr. Asima Shaukat


93 students
Batch A
47 students
Batch B
46 students
10 groups
10 groups
First cycle
CRE + Process Control
Separation process I & II
Separation process I & II
CRE + Process Control
Second cycle

Batch A – 47 students

Group 1	1	ASHUTOSH KUMAR
	2	BUDARAJU ARAVIND
	3	UTKARSH SHARMA
	4	ADRIJA CHAKRAVORTY
	5	PRATEEK AGRAWAL
Group 2	6	GURSAHAJ SINGH
	7	SANYOG GHOSH
	8	AMAN SINGH YADAV
	9	MANDALAM TARUN
	10	PATEL VEDANT JAYESHKUMAR
Group 3	11	KUNWAR PRASHANT
	12	NAYAN NOVAL
	13	SHREYANS VERMA
	14	SHAH RAHUL MUKESHBHAI
	15	AKHIL VERMA
Group 4	**16**	**AYUSH NAGAR**
	17	VINAMRA GARG
	18	KUMAR ANKIT
	19	MOHIT JAIN
	20	VAIBHAV SRIDHAR
Group 5	21	ADITI GUPTA
	22	SHREYASH SURESH SAWANT
	23	JUNNARKAR JUI SUBHASH
	24	MADHUMITA RAMESH
	25	ALBRITE BEN

Group 6	26	KSHITIJ SAPRA
	27	AKSHAT GUPTA
	28	GUNJAN SAMTANI
	29	PUJARI ADITYA RAJENDRA
	30	ANKITHA ATHREYA RAMACHANDRAN
Group 7	31	UTKARSH TIWARI
	32	GANDHI RAJAT PARAGBHAI
	33	RITWIK PRABHAT
	34	SARVGYA KUMAR
	35	HARSHAL SUYASH MARATHE
Group 8	36	BAGANIKAR GOURAV UMESH
	37	SATYDEEP SINGH MATREJA
	38	ANANT BANSAL
	39	TUSHAR DAMANI

Group 9	**40**	**SHREYA RAI**
	41	AYUSH RANJAN
	42	DIVYA DINKAR HEGDE
	43	MANN MANOHAR VERLEKAR
Group 10	44	P. V. U. M. SAI
	45	SHRUTI
	46	VIDIT MEHTA
	47	RITVIK HEGDE

Batch B – 46 students

Group 11	48	VIGNESH SATHYASEELAN
	49	NIRANJAN S
	50	PRATHMESH MAYANDE
	51	SWASTIK CHNADRA
	52	RIA SRIVASTAVA
Group 12	53	SREEHARI U KARTHA
	54	SHUBH KHANDELWAL
	55	DEV KUMAR SINGH
	56	SHREYANSH KAUSHIK
	57	GURMAN SINGH
Group 13	58	CHOBE ADITYA CHANDRASHEKHAR
	59	PARITOSH SANJAY USMANPURKAR
	60	VIVEK SOLOMON SEELI
	61	AAMOD VINAYAK ATRE
	62	PULAKSH KHIMESARA

Group 14	**63**	**PRAHARSHITHA AYITHAPU**
	64	JAY SHINDE
	65	VISHNU NAIR
	66	ATHARVA NITIN JOSHI
	67	MOHAMMED SHABBAR
Group 15	68	VEDANT PATNAIK
	69	ARVIND RAMAN
	70	AGRAWAL AKHILESH DEEPAK
	71	MUKUND DHAWAN
	72	PARAKH KISHOR JAIPURKAR

Group 16	73	MOHIT VIJAYVERGIYA
	74	ANUNAY RAJHANS
	75	SIDDESH SATISH PATIL
	76	VARUN SINGH
	77	SIDDHANT SHAILESH WAIKAR
Group 17	78	ISHIKA GUPTA
	79	MUSKAN AGARWAL
	80	JAIN AMEY MANOJKUMAR
	81	DEDHIA HET SOHIT
Group 18	82	M KOUNDINYA
	83	JASH VARDHAN JAIN
	84	VIBHOR MITTAL
	85	SHRENIK GOLECHHA

Group 19	**86**	**SARANGULA SAI THAPAS**
	87	ANURAG PANDEY
	88	ASHUTOSH VASHIST
	89	PROJIT DEY
Group 20	90	MAHOTSAV PRIYA
	91	UTKARSH RAJ
	92	KOHLI ANMOL SANJAY
	93	PIYUSH SANJEEV AGARW

Batch A	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Exp 9	Exp 10
Lab 1	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10
Lab 2	Group 10	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9
Lab 3	Group 9	Group 10	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Lab 4	Group 8	Group 9	Group 10	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Lab 5	Group 7	Group 8	Group 9	Group 10	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Lab 6	Group 6	Group 7	Group 8	Group 9	Group 10	Group 1	Group 2	Group 3	Group 4	Group 5
Lab 7	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 1	Group 2	Group 3	Group 4
Lab 8	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 1	Group 2	Group 3
Lab 9	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 1	Group 2
Lab 10	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 1

Batch A	Exp 11	Exp 12	Exp 13	Exp 14	Exp 15	Exp 16	Exp 17	Exp 18	Exp 19	Exp 20
Lab 11	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10
Lab 12	Group 10	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9
Lab 13	Group 9	Group 10	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Lab 14	Group 8	Group 9	Group 10	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Lab 15	Group 7	Group 8	Group 9	Group 10	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Lab 16	Group 6	Group 7	Group 8	Group 9	Group 10	Group 1	Group 2	Group 3	Group 4	Group 5
Lab 17	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 1	Group 2	Group 3	Group 4
Lab 18	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 1	Group 2	Group 3
Lab 19	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 1	Group 2
Lab 20	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 1

Batch B	Exp 11	Exp 12	Exp 13	Exp 14	Exp 15	Exp 16	Exp 17	Exp 18	Exp 19	Exp 20
Lab 1	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20
Lab 2	Group 20	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19
Lab 3	Group 19	Group 20	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18
Lab 4	Group 18	Group 19	Group 20	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17
Lab 5	Group 17	Group 18	Group 19	Group 20	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16
Lab 6	Group 16	Group 17	Group 18	Group 19	Group 20	Group 11	Group 12	Group 13	Group 14	Group 15
Lab 7	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 11	Group 12	Group 13	Group 14
Lab 8	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 11	Group 12	Group 13
Lab 9	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 11	Group 12
Lab 10	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 11

Batch B	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Exp 9	Exp 10
Lab 11	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20
Lab 12	Group 20	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19
Lab 13	Group 19	Group 20	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18
Lab 14	Group 18	Group 19	Group 20	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17
Lab 15	Group 17	Group 18	Group 19	Group 20	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16
Lab 16	Group 16	Group 17	Group 18	Group 19	Group 20	Group 11	Group 12	Group 13	Group 14	Group 15
Lab 17	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 11	Group 12	Group 13	Group 14
Lab 18	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 11	Group 12	Group 13
Lab 19	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 11	Group 12
Lab 20	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 11

Proposed Evaluation Scheme

Components	Weightage %
1. Continuous Evaluation	**50**
a. Performance, Initial viva	5+10 (15 marks)
b. Regular Viva, Report	20+15 (35 marks)
3. Final Exam	**30**
4. Comprehensive Viva (by Department Senior faculty)	**20**

Lab Protocol

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- Arrive at correct time to the lab (**2:00 pm sharp)**

- **Collect your file** (office spring file) from the instructor. Put your report in the file and update the index (first page in your file)

- At **2.05 pm attendance** will be taken and file of each group will be checked

- **Initial viva** will be conducted to test your preparedness

- **Carry out the experiment** (no one is allowed to leave the lab during this time without instructors permission)

- **Tabulate your results** and get them checked and signed by the instructor. Include this page in the report.

- Regular viva based on the previous experiment and the report will be conducted.

Report

Index page

S. No.	Name of experiment	Dates of conduction	Dates of submission	Instructors signature

Report

1. Objective
2. Brief theory
3. Experimental set-up
4. Observation table
5. Calculations
6. Discussion and conclusions
7. Answer the questions given in the manual file (under learn more)
8. References (if any)

Evaluation of Report (general distribution)

- Neatness and presentation
- Calculations correctly done
- Discussion and conclusions are properly mentioned
- Learn more questions answered
- Graphs neatly plotted, axes correctly labeled

LABORATORY GUIDELINES

1. Students should behave in a *mature and responsible manner* at all times in the laboratory or wherever chemicals are stored or handled.
2. Students must *follow all verbal and written instructions carefully*. If you are unsure of the procedure, ask your instructor for help before proceeding.
3. Students *should not touch any equipment or chemicals* unless specifically instructed to do so.
4. Students *must not eat, drink, apply cosmetics or chew gum* in the laboratory. Wash hands thoroughly after participating in any laboratory activities.
5. Students *must perform only those experiments which are authorized* by the instructor.
6. Students will receive training related to the locations and operating procedures for all applicable laboratory safety equipment and personal protective equipment.

SAFETY

1. *Properly dispose of all chemical waste* as directed.
2. *Never enter the science storage rooms or preparation areas* unless accompanied by an instructor.
3. *Wear ANSI-approved eye protection* whenever chemicals, heat or glassware are used by either the instructor or students in the laboratory. Students should *wear appropriate personal apparel at all times* in the laboratory and also avoid wearing loose or flammable clothing; long hair should be tied back.
4. *Report any incident (including all spills, breakages or other releases of hazardous materials)* to the instructor immediately, no matter how insignificant it may appear. This should include **all injuries** such as cuts, burns or other signs of physical harm.
5. *Never remove chemicals, equipment or supplies* from the laboratory area.
6. *Carefully examine all equipment before each use* and report any broken or defective equipment to the instructor immediately.

NOTE

- Notices will be displayed on Chemical Engineering Group Notice Board/ Moodle

- Make-up will be granted for genuine cases only (on any account without prior permission, barred from writing final exam). Prior permission of IC is compulsory

- Final evaluation of a student would only be carried out when he/she has completed all the components of this course

- Lab coat and shoes are compulsory

- Exercise precaution while operating equipments/instruments

THANK YOU