

Department of Chemical Engineering

September 24, 2014

Minutes of the DFB meeting held on 16/09/2014 (Tuesday):

The following members were present:-

- | | | |
|--------------------------|---|----------|
| 1) Prof. S. Basu | - | Chairman |
| 2) Prof. S. K. Gupta | | |
| 3) Prof. K. K. Pant | | |
| 4) Prof. A. S. Rathore | | |
| 5) Dr. Anupam Shukla | | |
| 6) Dr. V. V. Buwa | | |
| 7) Prof. S. Roy | | |
| 8) Dr. M. A. Shaik | | |
| 9) Dr. Sreedevi U. | | |
| 10) Dr. Jayati Sarkar | | |
| 11) Dr. S. K. Pattanayek | | |
| 12) Dr. SanatMohanty | | |
| 13) Dr. Gaurav Goel | | |
| 14) Dr. Paresh Chokshi | | |
| 15) Dr. JyotiPhirani | | |
| 16) Dr. M. C. Ramteke | | |
| 17) Dr. M. A. Haider | | |
| 18) Dr. Anil Verma | | |

1. **Confirmation of the minutes of meeting held on 02/09/2014:** The minutes of the meeting held on 02/09/2014 were confirmed.
2. **Proposal to float two new courses by Centre for Biomedical Sciences:** The following comments were received from the faculty members:
BML860 (3-0-0): Nanomedicine
 - More focus should be made on the medicinal applications**BML850 (3-0-0): Cancer: Diagnosis and Therapy**
 - The use of monoclonal antibodies for cancer treatment (presently the state of the art treatment) may be included in the course outline.
 - The use of diagnostic markers to target appropriate therapy (e.g. use of Trastuzumab for HER2-positive patients)" may be included.
3. **Ratification of allocation of courses for Semester II 2014-15:** The list of courses to be floated for II Semester 2014-15 was approved (Annexure 1).
4. **UG curriculum - Minor areas/Advanced standing:** DFB identified the modules for minor area of advanced standing for UG students.
 - a. The department offers four modules for minor area / advanced standing for UG students: (1) Energy and Environment, (2) Complex Fluids and Materials, (3) Process Engineering, Modeling and Optimization, and (4) Biopharmaceuticals and Fine Chemicals.

Item relevant to
UCIC

- b. Type of all four modules – Minor area / Departmental Specialization
- c. There will be no upper limit on number of students registering in any of the four areas of departmental specialization.
- d. Department allows students from other departments to register for any of these streams of advanced standing as their minor area.
- e. There will be no core course in any of the minor areas/advanced standing streams. In each minor area, the student will have to register for 5 courses (3 credits each) plus one B.Tech. project (5 credit).

The list of courses in each area of Departmental Specialization has been approved (**Annexure II**).

- 5. **Ph.D. course plan:** The semester-wise course plan for the PhD program was approved (**Annexure III**).
- 6. **PG curriculum:** The course plans for MTech, MS(R) and Dual-degree programs was approved (**Annexure IV**).
- 7. **Vision statement of the Department for next five years:** The vision statement finalized earlier was further modified to bring out a shorter version.
"To become world leader in understanding fundamentals and CREATING technologies related to energy, environmental protection, novel materials and healthcare and carry focused research programs IN COLLABORATION with industry, institutions, universities and government agencies leading to joint IPR and spin-offs."
- 8. **Payment of honorarium to invited guest expert for lecture courses:** The DFB discussed and approved the provision for paying honorarium to industry/academic experts for delivering guest lecture(s) in the lecture courses from the Institute funds.



(S. Basu)
Chairman, DFB



(A. K. Saroha)
Secretary, DFB

Annexure II

Course Options in Different Minor Areas / Department Specialization

Energy and Environment	Complex Fluids and Materials	Process Engineering, Modeling and Optimization	Biopharmaceuticals and Fine Chemicals
Principles of Electrochemical Engineering	Structures and Properties of Polymers	Powder Processing and Technology	Experimental Characterization of BioMacromolecules
Electrochemical Methods	Introduction to Complex Fluids	Safety and Hazards in Process Industries	Bioprocessing and Bioseparations
Electrochemical Conversion and Storage Devices	Transport Phenomena in Complex Fluids	Materials of Construction	Molecular Biotechnology and in-vitro Diagnostics
Fundamentals of Fuel Cell Technology	Thermodynamics of Complex Fluids	Design of Multicomponent Separation Processes	Fine Chemicals Technology
Hydrogen Energy and Fuel Cell Technology	Simulation Techniques for Complex Fluids	Membrane Science and Engineering	Structure, Transport and Reactions in BioNano Systems
Petroleum Refinery Engineering	Polymerization Process Modeling	Process Utilities and Pipeline Design	Interfacial Behaviour and Transport of Biomolecules
Applied Reservoir Engineering	Granular Materials	Process Operations Scheduling	Membrane Science and Engineering
Reservoir Production Engineering	Complex Fluids Technology	Process Optimization	
Biomass Conversion and Utilization	Nano-engineering of Soft Materials	Advanced Process Control	
Heterogeneous Catalysis and Catalytic Processes	Interfacial Engineering	Process Modeling and Simulation	
Petrochemical Technology		Evolutionary Computation	
Molecular Modeling of Catalytic Reactions		Chemical Engineering Mathematics	
Industrial Multiphase Reactors		Population Balance Modeling	
Process Intensification and Novel Reactors		Advanced Computational Techniques in Chemical Engineering	
Experimental Characterization of Multiphase Reactors		Process Plant Design	
Environmental Engineering and Waste Management		Fundamentals of Computational Fluid Dynamics	
Air Pollution Control Engineering		Applications of Computational Fluid Dynamics	
Membrane Science and Engineering			

The following rules apply for registration in Minor Area:

- There will be no core course in any of the minor areas/advanced standing streams.
- There will be no upper limit on the number of students registering in any of the four areas of advanced standing.
- The Department allows students from other departments to register as their minor area for any of these streams of advanced standing.
- In each minor area, the student will have to take 5 courses (3 credits each) plus one B.Tech. project (5 credit).

List of Courses in New Curriculum

Department Core (UG):

S. No.	Course Title	Credits
1. (L)	Transport Phenomena	(3-1-0) 4
2. (L)	Material and Energy Balances	(2-2-0) 4
3. (L)	Chemical Engineering Thermodynamics	(3-1-0) 4
4. (L)	Chemical Reaction Engineering I	(3-1-0) 4
6. (L)	Chemical Reaction Engineering II	(3-0-0) 3
7. (L)	Fluid Mechanics for Chemical Engineers	(3-1-0) 4
8. (L)	Heat Transfer for Chemical Engineers	(3-1-0) 4
9. (L)	Mass Transfer I	(3-0-0) 3
10. (L)	Mass Transfer II	(3-1-0) 4
11. (L)	Fluid-Particle Mechanics	(3-1-0) 4
12. (L)	Process Dynamics and Control	(3-1-0) 4
13. (L/P)	Numerical Methods in Chemical Engineering	(3-0-2) 4
14. (L)	Introduction to Industrial Biotechnology	(3-0-0) 3
4. (L)	Chemical Process Technology and Economics	(3-1-0) 4
15. (L)	Introduction to Materials for Chemical Engineers	(3-0-0) 3
16. (P/L)	Instrumentation and Automation	(1-0-3) 2.5
17. (P)	Chemical Engineering Laboratory I	(0-0-3) 1.5
18. (P)	Chemical Engineering Laboratory II	(0-0-3) 1.5
19. (P)	Chemical Engineering Laboratory III	(0-0-3) 1.5
20. (P)	B. Tech. project	(0-0-8) 4
	Total Core Credits	67

List of Elective Courses from the Department:

Courses marked with * indicate courses to be floated as electives only for UG (B. Tech. and Dual Degree).

Sr. No.	Course Title	Credits
1.	Powder Processing and Technology*	(3-0-0) 3
2.	Safety and Hazards in Process Industries*	(3-0-0) 3
3.	Materials of Construction*	(3-0-0) 3
4.	Nano-engineering of Soft Materials*	(3-0-0) 3
5.	Design of Multicomponent Separation Processes	(3-0-0) 3
6.	Process Utilities and Pipeline Design*	(3-0-0) 3
7.	Environmental Engineering and Waste Management*	(3-0-0) 3
8.	Heterogeneous Catalysis and Catalytic Reactors	(3-0-0) 3
9.	Petrochemical Technology*	(3-0-0) 3
10.	Interfacial Engineering	(3-0-0) 3
11.	Fundamentals of Computational Fluid Dynamics	(2-0-2) 3
12.	Applications of Computational Fluid Dynamics	(2-0-2) 3
13.	Process Operations Scheduling	(3-0-0) 3
14.	Process Optimization	(3-0-0) 3
15.	Bioprocessing and Bioseparations	(3-0-0) 3
16.	Structures and Properties of Polymers	(3-0-0) 3
17.	Membrane Science and Engineering	(3-0-0) 3
18.	Petroleum Refinery Engineering	(3-0-0) 3
19.	Fine Chemicals Technology	(3-0-0) 3
20.	Chemical Engineering Mathematics	(3-0-0) 3
21.	Population Balance Modeling	(3-0-0) 3
22.	Advanced Computational Techniques in Chemical Engineering	(2-0-2) 3
23.	Process Plant Design*	(3-0-0) 3
24.	Product Development and Commercialization	(3-0-0) 3
25.	Principles of Electrochemical Engineering	(3-0-0) 3
26.	Electrochemical Methods	(3-0-0) 3
27.	Electrochemical Conversion and Storage Devices	(3-0-0) 3
28.	Hydrogen Energy and Fuel Cell Technology	(3-0-0) 3
29.	Petroleum Reservoir Engineering	(3-0-0) 3
30.	Petroleum Production Engineering	(3-0-0) 3
31.	Biomass Conversion and Utilization	(3-0-0) 3
32.	Introduction to Complex Fluids	(3-0-0) 3
33.	Transport Phenomena in Complex Fluids	(3-0-0) 3
34.	Thermodynamics of Complex Fluids	(3-0-0) 3
35.	Simulation Techniques for Complex Fluids	(3-0-0) 3
36.	Polymerization Process Modeling	(3-0-0) 3
37.	Granular Materials	(3-0-0) 3
38.	Complex Fluids Technology	(3-0-0) 3
39.	Molecular Modeling of Catalytic Reactions	(3-0-0) 3
40.	Industrial Multiphase Reactors	(3-0-0) 3
41.	Process Intensification and Novel Reactors	(3-0-0) 3
42.	Experimental Characterization of Multiphase Reactors	(3-0-0) 3
43.	Experimental Characterization of BioMacromolecules	(3-0-0) 3
44.	Product and Process Integration	(3-0-0) 3
45.	Interfacial Behaviour and Transport of Biomolecules	(3-0-0) 3

46.	Molecular Biotechnology and in-vitro Diagnostics	(3-0-0) 3
47.	Advanced Process Control	(3-0-0) 3
48.	Process Modeling and Simulation	(3-0-0) 3
49.	Evolutionary Optimization	(3-0-0) 3
50.	Air Pollution Control Engineering	(3-0-0) 3
51.	Structure, Transport and Reactions in BioNano Systems	(3-0-0) 3
52.	Advanced Chemical Engineering Thermodynamics	(3-0-0) 3
53.	Advanced Transport Phenomena	(3-0-0) 3
54.	Selected Topics in Chemical Engineering	(3-0-0) 3

Annexure III

Course Plan for PhD Students

Course credit requirement for PhD:

Bridge course 1 (Transport Phenomena, Num. Methods (UG level): 2

Bridge course 2 (Thermodynamics, Reaction Engineering (UG Level): 2

One of four courses (Advanced Transport Phenomena, Advanced Thermodynamics, Ind. Multiphase Reactors, Structure, Transport and Reactions in BioNano Systems): 3

Research area related course (any Department 700 level courses and above): 3 (as advised by the SRC)

Course on Technical Communication Skills (1 Credit) – Audit compulsory (offered by the Department)

Total = 10 (mini. Credits)

All credit requirements to be completed before the comprehensive examination.

Entrants (January – July):

- Sem 1: Two bridge courses (compulsory, core)
 Advanced Thermodynamics (optional)
 Structure, Transport and Reactions in BioNano Systems (optional)
 Course related to research topic (optional)
- Sem 2: Advanced Transport Phenomena (optional)
 Ind. Multiphase Reactors (optional)
 Course related to research topic (optional)

Entrants (August – December):

- Sem 1: Two bridge courses (compulsory, core)
 Ind. Multiphase Reactors (optional)
 Advanced Transport Phenomena (optional)
 Course related to research topic (optional)
- Sem 2: Advanced Thermodynamics (optional)
 Structure, Transport and Reactions in BioNano Systems (optional)
 Course related to research topic (optional)

* The students can register for the courses for a longer duration but the bridge courses must be completed in the first full semester of residence. All 10 credits must be completed by the comprehensive examination.