List of Revised Courses

Department : *Chemical Engineering*

Program Name : *B.Tech.*

Academic Year : 2017-18

List of Revised Courses

Sr. No.	Course Code	Name of the Course
01.	CH5TPC07	Mass Transfer-I
02.	CH5TPE11	Engineering Materials
03.	CH5TPE14	Polymer Technology
04.	CH6TPE21	Process Equipment Design-I
05.	CH6TPE31	Fuel Combustion Energy Technology

Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2017-18

School : *School of Studies of Engineering and Technology*

Department : *Chemical Engineering*

Date and Time : *May 24, 2017 – 11:30 AM*

Venue : *HoD room*

Minutes of Meeting

The scheduled meeting of members of Board of Studies (BOS) was held today in the office of HOD Chemical Engineering to design and discuss the scheme and syllabus of B.Tech.(Chemical Engg.) V and VI semester as per CBCS, also to review Pre-PhD course work Teaching Scheme for the Department of Chemical Engineering. Following members were present in the meeting.

1. Prof. S.N. Saha (Chairman, BOS and HOD, Chemical Engg.)
2. Dr. A. K. Chandrakar (Member BOS, Asst. Prof., Department of Chemical Engg.)
3. Dr. R.S. Thakur (Invited member, Asst. Prof. Department of Chemical Engg.)
4. Mr. Neeraj Chandraker (Invited member, Asst. Prof. Department of Chemical Engg.)
5. Mrs. Arpita Roychaudhury (Invited Member, HoD, Industrial & Production Engg.)

In this meeting, above mentioned members discussed and proposed the scheme and syllabus of B. Tech. Chemical Engineering V and VI semester as per CBCS as enclosed 26 pages duly signed by the Chairman and Members.

As per the direction from AR(Acad.), vide 1039/Acad./T.S./2017, dt. 24/03/17 w.r.t. the decision of Standing Committee of Academic Council meeting dt. 7/3/2017, the BoS Members have resolved to consider for reading the 'Seminar' subject CHPHDS01 in already approved Evaluation scheme for Pre-Ph.D. course work as QUALIFIED / NOT QUALIFIED in consistency with other departments of this University.

Since the Member Prof. Chandan Guha (Department of Chemical Engineering, Jadavpur University, Kolkata) could not attend this meeting due to his pre-occupation, as per his suggestion on telephonic conferencing with the members, this scheme and syllabus is to be sent to the external BOS member Prof. Guha, for his review and formal consent as on today (24/5/2017).

24/5/17
Prof. S.N. Saha
Chairman, BOS
HOD, Chemical Engg.

24/5/17
Dr. A.K.Chandrakar
Member, BOS
Asst. Prof. Chemical Engg.

24/05/17
Dr. R.S. Thakur
Invited Member, BOS
Asst. Prof. Chemical Engg.

24.05.17
Mr. Neeraj Chandraker
Invited Member, BOS
Asst. Prof. Chemical Engg.

24/05/17
Mrs. Arpita Roychaudhuri
Invited Member, BoS
HoD, Industrial & Production Engg.

The following courses were revised in the of B. Tech. Third year (V and VI Semesters) :

- Mass Transfer-I (CH5TPC07)
- Engineering Materials (CH5TPE11)
- Polymer Technology (CH5TPE14)
- Process Equipment Design-I (CH6TPE21)
- Fuel Combustion Energy Technology (CH6TPE31)

The following new courses were introduced in the of B. Tech. Third year (V and VI Semesters):

- Fundamentals Of Chemical Engineering (CH5TPE12)
- Food Engineering (CH5TPE13)
- Fluidization Engineering (CH5TOE11)
- Financial Management (CH5TOE12)
- Managerial Economics (CH5TOE13)
- Financial Accounting And Costing (CH5TOE14)
- Fertilizer Technology (CH6TPE22)
- Enterprise Resource Planning (CH6TOE22)
- Management Information System (CH6TOE23)
- Six Sigma And DOE (CH6TOE24)

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Signature & Seal of HoD

Scheme and Syllabus

DEPARTMENT OF CHEMICAL ENGINEERING
INSTITUTE OF TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University Established by the Central University Ordinance 2009, No. 3 of 2009)

SCHEME FOR EXAMINATION
B.Tech. (FOUR YEAR) DEGREE COURSE, CHEMICAL ENGINEERING

THIRD YEAR, FIFTH SEMESTER

S. No.	Course No.	Subject	Periods			Evaluation Scheme					Credits
						Sessional			ESE	Sub Total	
	THEORY		L	T	P	IA	MSE	Total			
01.	CH5TPC06	Heat Transfer	3	1	0	20	20	40	60	100	4
02.	CH5TPC07	Mass Transfer-I	3	1	-	20	20	40	60	100	4
03.	CH5TPC08	Chemical Reaction Engineering-I	3	1	-	20	20	40	60	100	4
04.	CH5TPE1X		3	1	-	20	20	40	60	100	4
05.	CH5TOE1X		3	0	-	20	20	40	60	100	3
	PRACTICAL										
01.	CH5PPC03	Heat Transfer Lab	-	-	3	30	-	30	20	50	2
02.	CH5PPC04	Mass Transfer-I Lab	-	-	3	30	-	30	20	50	2
03.	CH5PPC05	Chemical Reaction Engineering Lab	-	-	3	30	-	30	20	50	2
	TOTAL		15	4	9					650	25

IA – Internal Assessment
MSE – Mid Semester Examination
ESE - End Semester Examination

Total Marks – 650
Total Periods - 28
Total Credits - 25

BOS held on 24th May 2017

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SCHEME FOR EXAMINATION
B.Tech. (FOUR YEAR) DEGREE COURSE, CHEMICAL ENGINEERING

THIRD YEAR, SIXTH SEMESTER

S. No.	Course No.	Subject	Periods			Evaluation Scheme					Credits
						Sessional			ESE	Sub Total	
	THEORY		L	T	P	IA	MSE	Total			
01.	CH6TPC09	Mass Transfer-II	3	1	-	20	20	40	60	100	4
02.	CH6TPC10	Process Dynamics and Control	3	1	-	20	20	40	60	100	4
03.	CH6TPC11	Organic Chemical Technology	3	-	-	20	20	40	60	100	3
04.	CH6TPE2X		3	1	-	20	20	40	60	100	4
05.	CH6TPE3X		3	1	-	20	20	40	60	100	4
06.	CH6TOE2X		3	0	-	20	20	40	60	100	3
	PRACTICAL										
01.	CH6PPC06		-	-	3	30	-	30	20	50	2
02.	CH6PPC07		-	-	3	30	-	30	20	50	2
	TOTAL		18	4	6					700	26

IA – Internal Assessment
Total Marks – 700

MSE – Mid Semester Examination
Total Periods - 28

ESE - End Semester Examination
Total Credits – 26

I agree 24/5/17
Dr. Chandan Guha
Professor
CHEMICAL ENGINEERING DEPT.
JADAVPUR UNIVERSITY
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24/5/17 BOS held on 24th May 2017

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LIST OF PROFESSIONAL ELECTIVES OFFERD BY THE DEPARTMENT OF CHEMICAL FOR V and VI SEMESTER

Semester	Subject Code (PE)	Subject
V	CH5TPE11	Engineering Material
	CH5TPE12	Fundamentals of Biochemical Engineering
	CH5TPE13	Food Engineering
	CH5TPE14	Polymer Technology
VI	CH6TPE21	Process Equipment Desiga-I
	CH6TPE22	Fertilizer Technology
	CH6TPE31	Fuel Combustion Energy Technology
	CH6TPE32	Environmental Engineering

PE - Professional Elective

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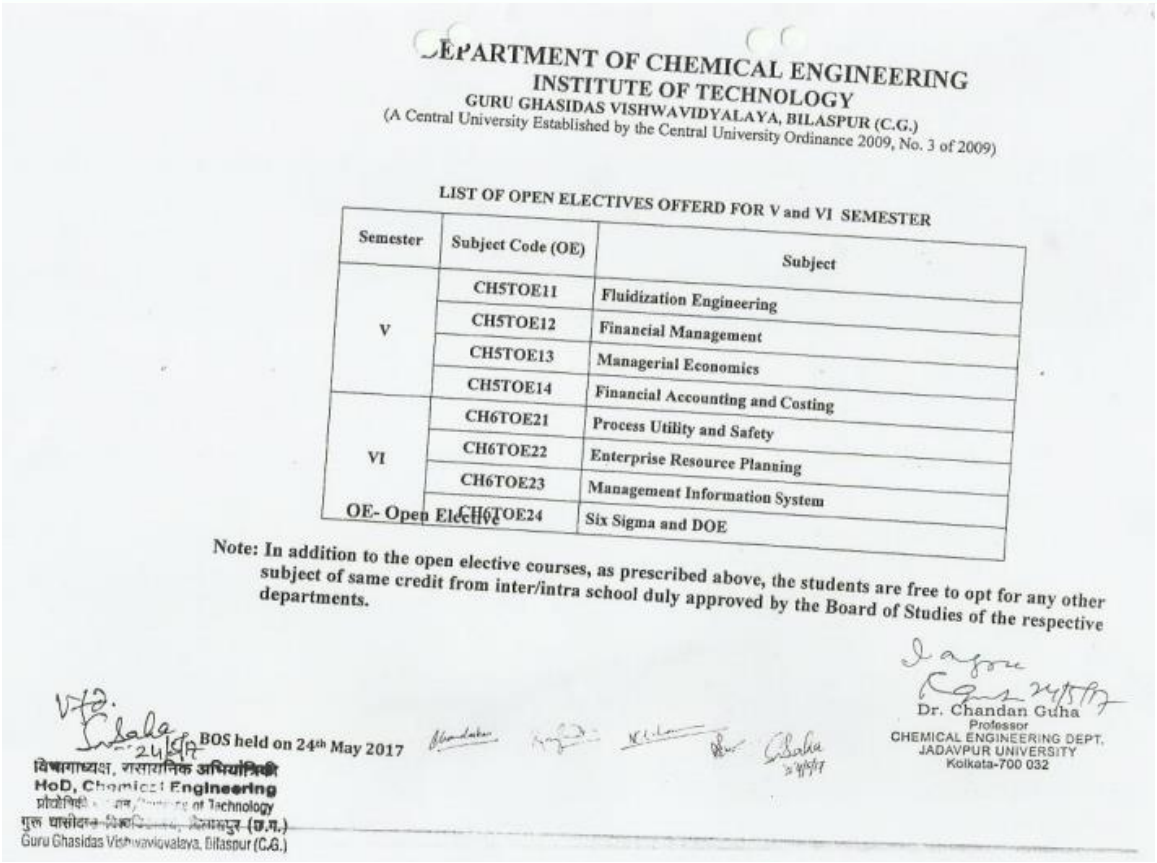

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LIST OF OPEN ELECTIVES OFFERD FOR V and VI SEMESTER

Semester	Subject Code (OE)	Subject
V	CH5TOE11	Fluidization Engineering
	CH5TOE12	Financial Management
	CH5TOE13	Managerial Economics
	CH5TOE14	Financial Accounting and Costing
VI	CH6TOE21	Process Utility and Safety
	CH6TOE22	Enterprise Resource Planning
	CH6TOE23	Management Information System
	CH6TOE24	Six Sigma and DOE

OE- Open Elective

Note: In addition to the open elective courses, as prescribed above, the students are free to opt for any other subject of same credit from inter/intra school duly approved by the Board of Studies of the respective departments.

BOS held on 24th May 2017

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40 percent change

CH5TPC07: Mass Transfer - I (3 1 0)

Unit I: Principle of Diffusion :Theory of diffusion, molecular diffusion in gases and liquids, Diffusion velocities, Mass transfer coefficient for mass transfer through known areas.

Unit II: Phase Equilibria :Vapor-liquid equilibrium curves and boiling point diagram, Volatility, Solubility of gases, Enthalpy –concentration diagrams.
Equilibrium Stage Operations Principles, Determination of number of ideal stages for two-component systems by graphical and absorption factor methods

Unit III: Flash distillation, differential distillation, steam distillation, Azeotropic distillation and Extractive distillation, Continuous distillation with rectification, Reflux ratio, Minimum reflux ratio, calculation of number of plats – Lewis sorel Method, McCabe Thiele Method.

Unit IV: Fenske equation, Optimum reflux ratio, Analysis of fractionating column by enthalpy concentration diagram method, Plate efficiencies, Packed Column, height equivalent to theoretical plate.

Unit V: Gas Absorption :Design of packed towers, Principles of absorption, Rate of absorption, Two film theory, Overall coefficients, HTU method, Interrelation between heat transfer, momentum transfer and mass transfer.

Text Books:

1. Mass Transfer by Robert E Trebyl, McGraw Hill Inc.
2. Unit Operations of Chemical Engineering by McCabe Warren, Smith Julian C andHarriot Peter. Fifth edition McGraw Hill Inc.
3. Principles of Mass Transfer and Separation Processes by B. K. Dutta, Prentice Hall, 2005.
4. Transport Processes and Unit Operations by C. J. Geankoplis, Prentice Hall International Inc.
5. Chemical Engineering Vol. I by Coulson J.M. & Richardson J.F.
6. Introduction to Chemical Engineering by Badger & Bancherro, TATA McGraw Hill Inc.

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40% Change

CH5TPE11: Engineering Materials (3 1 0)

Unit I : Crystalline and Non –Crystalline Material : Crystalline state, Atomic bonding, Bravias lattices; Miller indices, Structure of some common inorganic compounds, Structural imperfections: Point defects in crystals.
Economic, environmental and social issue of material usage.

Unit II: Mechanical Properties : Mechanical properties like elastic and plastic deformations, hardness, toughness, fatigue, creep etc. and their variation with temperature. **Failure of materials :** Failure of materials under service conditions.

Unit III : Corrosion : Mechanism of corrosion- dry and wet corrosion, Factors influencing corrosion, Atmospheric corrosion, Methods of corrosion control, Cathodic and anodic control, Inhibition and other precautionary measures.

Unit IV : Non-Ferrous Metals : Copper, Brasses, Bronze, Aluminium, their mechanical properties, Workability and applications, Corrosion resistance. Non-metallic materials of construction.

Unit V : Phase diagram : Phase rules, Equilibrium phase diagram, cooling curves and their relations to properties of metals and alloys , Iron –carbon equilibrium diagram. Response of materials to chemical environment.

Text Books:

1. CHEMTECH- Materials of Construction by O.P. Kharbanda
2. Corrosion and its Prevention III by K.S. Rajagopalan
3. Introduction to Material Science for Engineers by James F. Shackel Ford.
4. Element of Material Science and Engineering by L.H.Van Vlack
5. Corrosion Engineering by M.G.Fontanne and N.D. Grehnee.
6. Chemistry of Engineering Materials by C.K.Agrawal.
7. Materials Science and Engineering by V. Raghavan, Prentice Hall of India, New Delhi
8. Materials Science for Engineers by L. H. VanVlack, Addison-Wesley Publishing Co.

Reference Book:

1. Chemical Engineering HandBook by Robert H. Perry.

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40% Change

CH5TPE14: Polymer Technology (3 1 0)

Unit I : Introduction to Polymer Science : Classification of polymer and functionality, Polymerization, Polymer structure, Molecular weight distribution and thermal transition types.

Unit II : Polymer Synthesis : Step and Chain growth polymerization and its kinetics, Copolymerization and its kinetics, Reaction mechanism of synthetic Polymer.

Unit III : Conformation, Solution and Molecular Weight : Thermodynamics of polymer solution, Flory Huggins theory, Process of polymer dissolution, Nature of polymer molecules in solution, Measurement of molecular weight, Osmometry, Light scattering, GPC, Viscosity of dilute polymer solution.

Unit IV : Soild State Properties : Amorphous state, Glass transition temperature, Glassy solid and glass transition, The crystalline state, Crystal melting temperature, Degree of crystallinity & its effect on properties of polymer.

Unit V : Polymer Degradation & the Environmental Effect : Polymer stability and types of degradation. The management of plastics and its effect on environment, biodegradation.

Text books:

1. Polymer Science and Technology by Fried
2. Outlines of Polymer Technology by Sinha PHI

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I agree

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50% Change

CH6TPE21: Process Equipment Design-I (3 1 0)

Pressure and Storage Vessels : Design of pressure and storage vessels and their supports. End closures, Flat plates, Flanged, Dished, Hemispherical, Ellipsoidal and conical ends.

Text Books:

1. Introduction to Chemical Equipment Design (Mechanical Aspects) by B.C. Bhattacharya– Chemical Engineering Education Development Center.
2. Process Equipment Design By Brownell & Young
3. Process Equipment Design by M.V. Joshi
4. Chemical Engineering by Coulson J.M., Richardson Vol- I
5. Process Equipment Design by Shrikant D. Dawande

Reference Books:

1. Hand book of Chemical Engineering by J.H.Perry
2. IS Codes.

BOS held on 24th May 2017

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35% Change

CH6TPE31: Fuel Combustion Energy Technology (3 1 0)

Unit I : Solid Fuel : Classification of fuel, Origin, Composition, Characteristics and analysis of coal washing & storage of coal, Physical & chemical processing of coal, Various classification systems of coal briquetting, Carbonization, Gasification of coal.

Liquid fuels: Origin, composition, characteristics and classification of crude oil, crude oil processing cracking and reforming, storage and handling of liquid fuel

Gaseous fuel: Classification of gaseous fuel, Natural gas, Coal gas, Coke oven and blast furnace gas, producer gas, water and Carbureted water gas

Unit II: Fuel Combustion Calculation: Fundamentals of various combustion calculations with numerical examples.

Unit III: Combustion Process: General Principles of combustion, Flame, Draught, Limits of Inflammability, Types of combustion Process- Surface, Submerged, Pulsating, Slow combustion.

Unit IV: Energy Conservation: Energy consumption pattern in various sectors, various ways of energy conservation in various process industries including petroleum.

Unit V: Non – Conventional Energy Technologies : General principles with applications and technology of Biomass Energy, Solar Energy, Geothermal Energy, Wind Energy, Nuclear Energy, Hydal, Tidal and Ocean Energy.

Text Book:

1. Elements of Fuel Combustion & Energy Engineering by S.N. Saha, Dhanpat Rai Publication Co. Pvt. Ltd. New Delhi, 2014

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I agree 24/5/17

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