गुरू घासीदास विश्वविद्यालय (केंद्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya (A Central University Established by the Central Universities Act 2009 No. 25 of 2009) Koni, Bilaspur – 495009 (C.G.)

# **List of Revised Courses**

# Department

: Chemical Engineering

Programme Name : **B.**Tech.

Academic Year : 2020-21

# **List of Revised Courses**

Sr. No.	Course Code	Name of the Course
01.	CH05TPC08	Heat Transfer
02.	CH05TPC09	Mass Transfer-I
03.	CH05TPE11	Engineering Materials
04.	CH05TOE11	Fluidization Engineering
05.	CH06TPC11	Mass Transfer-II
06.	CH06TPE31	Fertilizer Technology
07.	MA201TBS01	Mathematics-I
08.	MA202TBS03	Mathematics-II
09.	EC201TES01	Basic Electrical And Electronics Engineering
10.	ME201PES01	Engineering Graphics
11.	EC201PES03	Basic Electrical And Electronics Engineering Lab

गुरू घासीदास विश्वविद्यालय (केन्नीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्नीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya (A Central University Established by the Central Universities Act 2009 No. 25 of 2009) Koni, Bilaspur – 495009 (C.G.)

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

Academic Year : 2020-21

School : School of Studies of Engineering and Technology

**Department** : Chemical Engineering

Date and Time : July 27, 2020 - 11:00 AM

Venue : Online

## Minutes of Meeting

The scheduled meeting of member of Board of Studies (BoS) of Department of Chemical Engineering. School of Studies of Engineering and Technology, Guru Ghasidas Vishwavidyalaya. Bilaspur was held today (July 27, 2020) in online mode (via Google Meet) to discuss the B.Tech. Third year (V and VI semesters) scheme and syllabi. The meeting was conducted in online mode due to Covid-19 pandemic and lock down. The following members were present in the meeting: 1. Prof. (Mrs.) A.B. Soni (External Expert Member BoS, Dept. of Chemical Engg., NIT Raipur) 2. Prof. S.N. Saha (Member BoS, Dept. of Chemical Engg.) 3. Dr. Anil Kumar Chandrakar (HoD (I/c), Associate Prof., Dept. of Chemical Engg.-cum-Chairman, BoS) Mrs. Anuradha Nanewar Joshi (Member BoS, Assistant Professor, Dept. of Chemical Engg.) 4 Dr. Sagar Kumar Jaiswal (Invited Member, HoD (I/c), Dept. of Law) Mr. Neeraj Chandraker (Invited Member, Assistant Professor, Dept. of Chemical Engg.) 7. Mr. Amit Jain (Invited Member, Assistant Professor, Dept. of Chemical Engg.) 8. Mr. G.P. Dewangan (Invited Member, Assistant Professor, Dept. of Chemical Engg.) 9. Dr. Raghwendra Singh Thakur (Invited Member, Assistant Professor, Dept. of Chemical Engg.) 10. Mr. Vishnu Prasad Yaday (Invited Member, Assistant Professor, Dept. of Chemical Engg.) 11. Mr. Saurabh Meshram (Invited Member, Assistant Professor, Dept. of Chemical Engg.) 12. Dr. Sandeep Dharmadhikari (Invited Member, Assistant Professor, Dept. of Chemical Engg.) 13. Dr. Ghoshna Jyoti (Invited Member, Assistant Professor, Dept. of Chemical Engg.) The committee discussed and approved the scheme and syllabi of B.Tech. Third year (V and VI Semesters). As per decision amongst members present in the meeting, this scheme and syllabus is being sent to external BoS members for their review and formal consent. Because of the pre occupancy of External Industry Expert Member, Mr. Suprangya Mohanty (Deputy Manager, HINDALCO, Mahan Unit, Bargawan, Singrauli) could not attend the online meeting. However, he has given the consent on the scheme and syllabi sent to him through mail. Indala Dr. Anil Kumar Chandrakar Prof. S.N. Saha Prof. (Mrs.) A.B. Soni External Expert Member, BoS Professor, Chemical Engg. Member, BoS Chairman, BoS Professor, Chemical Engg. HOD (1/c). Chemical Engg NIT, Raipur Terel Mrs. A.N. Joshi Me Mr. Neeraj Chandraker Dr. Sagar Kumar Jaiswal Invited Member Invited Member Member BoS Assistant Prof., Chemical Enge. HoD(I/c), Dept. of Law Assistant Prof., Chemical Enga Q Sala Analani Dr. Raghwendra Singh Thakur Mr. Saurabh Meshram Mr. Amit Jain Invited Member Invited Member Invited Membe Assistant Prof., Chemical Enge. Assistant Prof., Chemical Engg. Assistant Prof., Chemical Engg Gaul

Mr. Johnn Prasad Yaday Jawied Member Assistant Prof., Chemical Engg

Gir

Dr. Sandeep Dharmadhikari Invited Member 8 Assistant Prof. Chemical Engo

Dr. Ghoshna Jyoti Invited Member Assistant Prof., Chemical Line

Program Revision

Mr. G.T. Dewangan Invited Member

Istant Prof Chemical Long

Criteria – I (1.1.2)

गुरू घासीदास विश्वविद्यालय (केंद्रीय विस्तविद्याल अधिन्यम 2009 क. 25 के अंतर्गत स्वापित केंद्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya (A Central University Established by the Central Universities Act 2009 No. 25 of 2009) Koni, Bilaspur – 495009 (C.G.)

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

- Heat Transfer (CH05TPC08)
- Mass Transfer-I (CH05TPC09)
- Engineering Materials (CH05TPE11)
- Fluidization Engineering (CH05T0E11)
- Mass Transfer-II (CH06TPC11)
- Fertilizer Technology (CH06TPE31)

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

Constitution of India-Basic Features and Fundamental Principles (CH05TMC02)

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विभागाध्यक्ष, रासायनिक अभियांत्रिकी HoD, Chemical Engineering प्राद्योगिकी संस्थान/Institute of Technology गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.) Guru Ghasidas Vishwavidvalava, Bilaspur (C.G.)

Signature & Seal of HoD

गुरू घासीदास विश्वविद्यालय केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya (A Central University Established by the Central Universities Act 2009 No. 25 of 2009) Koni, Bilaspur - 495009 (C.G.)

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

# Academic Year : 2020-21

School : School of Studies of Engineering and Technology

Department : Chemical Engineering

Date and Time : December 29, 2020 - 11:00 AM

: Online Venue

## Minutes of Meeting

The scheduled meeting of member of Board of Studies (BOS) of Department of Chemical Engineering, School of Studies of Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur was held today (December 29, 2020) in online mode (via Google Meet) to discuss the B.Tech. First year-(I and II semesters) scheme and syllabi for CBCS-New pattern. This scheme and syllabi will be applicable for the students of the batch admitted in session 2020-21. The meeting was conducted in online mode due to Covid-19 pandemic situation. The following members were present in the meeting:

- 1. Prof. (Mrs.) A. B. Soni (External Expert Member BoS, Dept. of Chemical Engg., NIT Raipur)
- 2. Mr. Suprangya Mohanty (External Industry Expert Member BoS, Deputy Manager, HINDALCO, Mahan Unit, Bargawan, Singrauli)
- 3. Prof. S. N. Saha (Member BoS, Dept. of Chemical Engg.)
- 4. Dr. Anil Kumar Chandrakar (HOD, (I/e), Associate Prof., Dept. of Chemical Engg.-cum-Chairman, BOS)
- 5. Mrs. A. N. Joshi (Member BoS, Assistant Professor, Dept. of Chemical Engg.)
- 6. Mr. Amit Jain (Invited Member, Assistant Professor, Dept. of Chemical Engg.)
- 7. Mr. G. P. Dewangan (Invited Member, Assistant Professor, Dept. of Chemical Engg.)
- 8. Dr. Raghwendra Singh Thakur (Invited Member, Assistant Professor, Dept. of Chemical Engg.)
- 9. Mr. Vishnu Prasad Yadav (Invited Member, Assistant Professor, Dept. of Chemical Engg.)
- 10. Dr. Sandeep Dharmadhikari (Invited Member, Assistant Professor, Dept. of Chemical Engg.)

The committee discussed and approved the scheme and syllabi of B.Tech. First year (I and II Semesters). As per decision between members present in the meeting, this scheme and syllabus is being sent to external BOS members for their review and formal consent.

> Asoni Prof. (Mrs.) A. B. Soni External Expert Member, BoS Professor, Chemical Engg. NIT, Raipur

ale glokozo Prof. S. N. Saha Member, BoS Professor, Chemical Engg.

Mr. Amit Jain Invited Member istant Prof., Chemical Engg.

Mr. Suprangya Mohanty External Industry Expert Member, BoS Deputy Manager, HINDALCO Mahan Unit, Bargawan, Singarauli

a and rater Dr. Anit Kumar Chandrakar Chairman, BOS

memical E HOD (I/c), Chemical Engg.

Invited Member

Mer. A. N. Joshi Member, BOK Assistant Prof., Chemical Engg

Gart Mr. G. P. Dewangan Invited Memb Dr. Raghwendra Singh Thakur Assistant Prof., Chemical Engg.

Assistant Prof., Chemical Engg.

Mr. Vithou Prasad Yadav Invited Member Assistant Prof., Chemical Enge

Dr. Sandeep Dharmadhikari Invited Member Assistant Prof., Chemical Engg.

**Program Revision** 

Criteria – I (1.1.2)

गुरू घासीदास विश्वविद्यालय (केंद्रीय विस्तविद्याल अधिनियम 2008 क. 25 के अंतर्गत स्वापित केंद्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya (A Central University Established by the Central Universities Act 2009 No. 25 of 2009) Koni, Bilaspur – 495009 (C.G.)

The following courses were revised in the of B. Tech. First year (I and II semester):

- Mathematics-I (MA201TBS01)
- Mathematics-II (MA202TBS03)
- Basic Electrical And Electronics Engineering (EC201TES01)
- Engineering Graphics (ME201PES01)
- Basic Electrical And Electronics Engineering Lab (EC201PES03)

The following new courses were introduced in the of B. Tech. First year (I and II semester):

- Engineering Mechanics (CE201TES01)
- Engineering Mechanics Lab (CE201PES01)
- Basic Civil & Mechanical Engineering (CM201TES03)
- Indian Constitution (LW201TMC01)
- Introduction To Information Technology (IT202TES05)
- English Communication (EN202THS01)

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विभागाध्यक्ष, रासायनिक अभियांत्रिकी HoD, Chemical Engineering प्राद्योगिकी संस्थान/Institute of Technology गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.) Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Signature & Seal of HoD

गुरू घासीदास विश्वविद्यालय (केन्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya (A Central University Established by the Central Universities Act 2009 No. 25 of 2009) Koni, Bilaspur – 495009 (C.G.)

	(A Cel	ntral University Established by the Central University						2009)	
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02.	CH05TPC09	Mass Transfer-I	3	1	0	30	70	100	4
03.	CH05TPC10	Chemical Reaction Engineering-I	3	1	0	30	70	100	4
04.	CH05TPE1X	eacting reaction Engineering-1	3	1	0	30	70	100	4
05.	CH05TOE1X		3	0	0	30	70	100	3
06.	CH05TMC02	Constitution of India-Basic Features and Fundamental				30	70	100	3
	PRACTICAL	Principles	3	0	0	0	0	0	0
01.	CH05PPC06	11 - T		- 1				4	
02.	CH05PPC07	Heat Transfer Lab	0	0	3	30	20	50	1.5
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**Program Revision** 

Criteria – I (1.1.2)

## गुरू घासीदास विश्वविद्यालय (केन्द्रीय विश्वविद्यालय अधिन्यम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya (A Central University Established by the Central Universities Act 2009 No. 25 of 2009) Koni, Bilaspur – 495009 (C.G.)

### SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.) (A Central University Established by the Central University Ordinance 2009, No. 3 of 2009)

DEPARTMENT OF CHEMICAL ENGINEERING

### List of Professional Elective Courses (Fifth and Sixth semester)

S.No.	Semester	Course No.	Subjects
01.		CH05TPE11	Engineering Materials
02.	v	CH05TPE12	Organic Chemical Technology
03.		CH05TPE13	Polymer Technology
04.		CH06TPE21	Environmental Engineering
05.	VI	CH06TPE22	Fundamental of Biochemical Engineering
06.		CH06TPE31	Fertilizer Technology
07.		CH06TPE32	Fuel Combustion Energy Technology

### List of Open Elective Courses (Fifth and Sixth semester)

	S.No.	Semester	Course No.	Subjects	
	01.		CH05TOE11	Fluidization Engineering	
	02.		CH05TOE12	Financial Management	
	03.	V	CH05TOE13	Managerial Economics	
	04.		CH05TOE14	Financial Accounting and Costing	
200	05.		CH06TOE21	Process Utilities and Safety	Search 1
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## गुरू घासीदास विश्वविद्यालय (केन्नीय विश्वविद्यालय अधिन्यम 2009 क्र. 25 के अंतर्गत स्वापित केन्न्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



## Guru Ghasidas Vishwavidyalaya (A Central University Established by the Central Universities Act 2009 No. 25 of 2009) Koni, Bilaspur – 495009 (C.G.)

Department of Chemical Engineering II. Tech: Svilabus (AICTE) B.Tech, V Semester 11.:3, T:1, P:01 Heat Transfer CH05TPC08 Objectives 1. To provide a fundamental understanding of heat transfer in the mode of conduction, convection and radiation. 30% Change 2. To understand the fundamental laws and their correlation. 3. To understand basic knowledge of various beat transfer equipments. Contents: Unit-I: Introduction to three modes of heat transfer. Derivation of heat balance equation-Steady-sine dimensional solution for conduction heat transfer in Cartesian, exhadrical and spherical geometry, concept of conduction and tilm resistances, critical insulation thickness lumped system approximation and Biot number, approximate solution to unstendy conduction heat transfer by the use of Heissler charts Unit-H: Heat convection, boundary layers. Forced convection, Natural convection, Dimensionless parameters for forced and free convection heat transfer. Correlations for forced and free convection. Approximate solutions to laminar boundary layer equations (momentum and energy). Estimating heat transfer rates in faminar and turbulent flow situations using appropriate correlations for free and forced convection. Unit-III: Interaction of radiation with materials, definitions of radiative properties. Stefan Boltzmann's law, black and gray body radiation. Calculation of radiation near transfer between surfaces using radiative properties; view factors and the radiosity method. Unit-IV: Heat Transfer Equipments: Types of heat exchangers, General design of parallel and counter-current, Double pipe and Shell and Tube heat exchanger. Analysis and design of beat exchangers using both LMTD and r- NTU methods. Similarity between heat and mass transfer Unit-V: Heat Transfer with phase change: Evaporation-Types of evaporators and fields of their applications. Single and multiple effect evaporators: their design and operation, Vapour recompression, Heat transfer from condensing vapours. Heat transfer to boiling liquids. Boiling and Condensation heat trunsfer, Pool boiling curve Suggested Text Books : 1. Fundamentals of Momentum, Heat and Mass Transfer by J. R. Welty, C. E. Wicks, R. E. Wilson and G. L. Rorrer, John Wiley & Sons. 2. Unit Operations of Chemical Engineering by W. L. McCabe, J. C. Smith and P. Harriot, McGraw Hill Education. 3. Heat Transfer by J. P. Holman, S. Bhattacharya, McGraw Hill Education. 4. Process Heat Transfer by D. Q. Kern, Tata McGraw-Hill Publishing Company Limited Kanan Agaren Manan Chandret Berl S

# गुरू घासीदास विश्वविद्यालय (केन्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



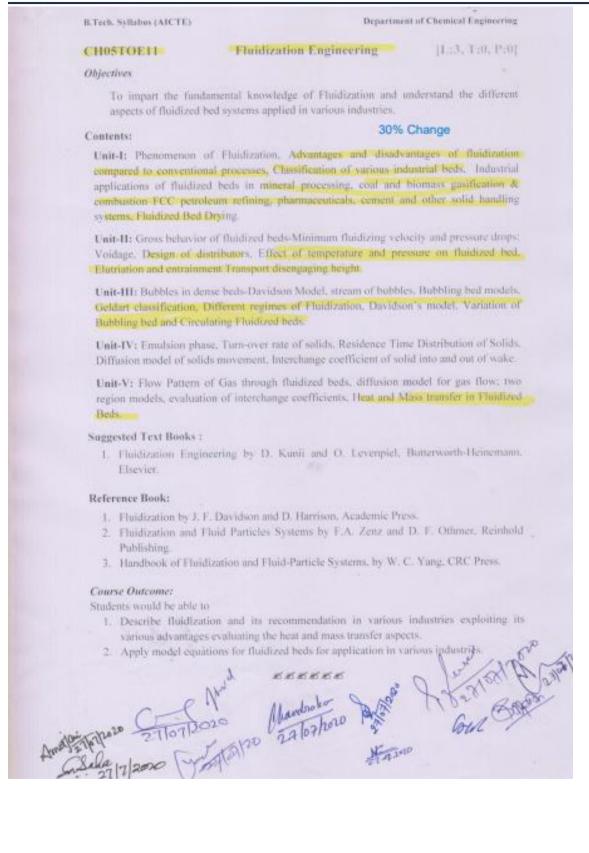
CH05TPC09 Mass Transfer-1 15%
Objectives 10.70
<ol> <li>To provide the understanding of mass transfer operations and equipments.</li> <li>To impart the understanding of separation processes such as diffusion, distillation and absorption.</li> </ol>
Contents:
Unit-I: Constitutive laws of diffusion, unsteady date diffusion, molecular diffusion in gases and liquids, Diffusion velocities. Convective mass transfer, interphase mass transfer and mass transfer coefficients, mass transfer correlations.
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. Pucked 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.
Suggested Text Books : 1. Principles of Mass Transfer and Separation Processes by B. K. Duna, PHI Learning Private Limited.
2. Mass Transfer Operations by R. E. Treybal, McGraw Hill,
<ol> <li>Diffusion - Mass Transfer in Fluid Systems by E.L. Cussler, Cambridge University Press.</li> </ol>
<ol> <li>Principles of Unit Operations by A. S. Foust, A. L. Wenzel, C. W. Chump, L. Maus and L. B. Anderson, John Wiley &amp; Sons.</li> </ol>
Course Outcome:
Students would be able to 1. Identify the concepts of phase equilibrium in mass transfer related problems.
<ol> <li>Identity the concepts of place equilibrium, diffusion and absorption and mass transfer</li> <li>Solve problems related to distillation, diffusion and absorption and mass transfer</li> </ol>
Design plate /packed column for mass transfer operations
Stintier States 1/2/2000 Prototo Super Con



CH05TPE11	Engineering Materials [L:3, T:0, P:0]
Objectives	time stars all
task for a partici circumstances.	ferstanding of material selections for construction to execute a ular application, its properties and behaviour at different ar and maintenance of various engineering materials.
Contents:	3% Change
Bravias lattices, Miller i	Ion-Crystalline Materials: Crystalline state, Atomic bonding, indices, Structure of some common inorganic compounds, conomic, environmental and social issues of material usage.
importance and limitation	perfices of materials and their variation with temperature, s of these properties on material selection for a particular rials. Failure of materials under service conditions.
Unit-III: Corrosion: Meel corrosion: Methods of corro	nanism of corrosion, Types of corrosion, Factors influencing ision control, Inhibition and other precautionary measures.
Unit-IV: Non-Ferrous M	etals: Copper, Brasses, Bronze, Aluminium, their mechanical J applications, Corrosion resistance. Non-metallic materials of
Unit-V: Phase diagram: Ph relations to properties of m materials to chemical enviro	uase rules. Equilibrium phase diagram, cooling curves and their etals and alloys, Iron-carbon equilibrium diagram. Response of orment.
Suggested Text Books :	
<ol> <li>Elements of Materials 5</li> <li>Materials Science and 1</li> <li>Materials Science for E</li> <li>Chemistry of Enginee Publications.</li> <li>Corrosion, Prevention</li> </ol>	ds Science for Engineers by James F, Shackelford, Pearson, Science and Engineering by L.H.Van Vlack, Pearson, Engineering by V, Raghavan, PHI Learning Private Limited, ingineers by L. H. VanVlack, Addison-Wesley Publishing Co. ering Materials by A. M. Sikkander and T. N. Balu, Raj and Control by K.S. Rajagopalan, Scientific Surveys Limited, by M. G. Fontana, McGraw Hill Education.
Reference Book: 1. Perry's Chemical Engi Hill Publication.	neers' Handbook by D. W. Green and R. H. Perry, McGraw
<ol> <li>Explain types of corrosi</li> <li>Describe phase diagram</li> </ol>	of materials and their mechanical properties and limitations, ion and various methods to control them. and its significance. The second broke brok brok both both both both both both both both

## गुरू घासीदास विश्वविद्यालय (केन्रीय विश्वविद्यालय अधिन्यम 2009 क्र. 25 के अंतर्गत खावित केन्द्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)





# गुरू घासीदास विश्वविद्यालय (केन्रीय विश्वविव्यालय अधिन्यम 2009 ज्ञ. 25 के अंतर्गत स्वापित केन्न्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



II. Tech. Syllabus (AICTE)	Department of Chemical Engineering
	B.Tech. VI Semester
CH06TPC11	Mass Transfer-II [L:3, T:1, P:0]
Objectives	in the second second manhatisms
<ol> <li>To provide basic knowle 2. To understand the mas and humidification oper</li> </ol>	edge of fundamental mass transfer operations and mechanisms, as transfer in 4.1.E. leaching, drying, crystallization, adsorption ration.
Contents:	
Unit-I: Humidification Op- of humidity and calculat Design of Conting Towers	erations: Definitions, Humidity chart and its use in measurement ions of humidification operations, Adiabatic humidification.
Unit-II: Leaching: Equip stages, Stage efficiency	ment. Principles of leaching. Calculation of number of ideal
method, Counter-current e in packed and spray colum	
erowth: Equipment and up	Principles, yield of crystals, Super solubility curve, Crystal plication of principles to design, orbers, break through, Ion-Exchange,
Unit-V: Deving: Equipme drying time	ent, Principles, Mechanism and theory of drying. Calculation of
Suggested Text Books : 1. L. Principles of Mass Private Limited.	Transfer and Separation Processes by B. K. Dutta, PHI Learning
2. Mass Transfer Operati	ions by R. E. Treybal, McGraw Hill.
Press.	ansfer in Fluid Systems by E.L. Cussler, Cambridge University
<ol> <li>Principles of Unit Op L. B. Anderson, John</li> </ol>	erations by A. S. Fount, A. L. Wenzel, C. W. Chump, L. Many and
Course Outcome:	
Students would be able to	p Mass Transfer and related laws.
7 Identification of meet	intristing of mass transfer. Formulation of rate equations,
3. Solve problems relate	ed to drying, feaching and crystallization.
Talibas Contractor Station	Alade Http2020



B. Tech. Syllabuv (AICTE)	Departu	nent of Chemical Engineering
CH06TPE31	Fertilizer Technology	[L:3, T:0, P:0]
Objectives		
	anding of essential knowledge of fertilize reaction and separation steps in a flow	
Contents:	1378	Change
essential Elements in pl fertilizer industry. Fert	izers and organic manures - types of che ant Growth, Macro elements and Micro e ilizer production and consumption in In utrients, Feedstock and raw materials fo	clements, Development of dia, Nutrient contents of
	rtilizers- Methods of production, Charact alphate, ammonium nitrate and ammonium	
	rtilizers Methods of production, Charact shosphate, triple super phosphate.	eristics. Specification and
	dizers- Methods of production, Characte loride, potassium sulphate and potassium s	Charles and the second s
	nd NPK fertilizers-Methods of pro ge of Mono arrinonium phosphate. Di-an and Environment.	
Press. 2. Shreve's Chemical 3. Chemistry & Tech	of Chemical Technology by M. G. Rao Process Industries by G. T. Austin, Tata 9 nology of Fertilizers by A.V. Slack, Inters ogy by G.N. Pandey and S.D. Sbukla, Van	McGraw Hill Publications, cience.
Course Outcome: Students would be able	to id unit operations steps in manufacturing o	of unselong familiance
and the second se	tion process and engineering problems in Exercise Alfred	

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### SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.) (A CENTRAL UNIVERSITY)

**CBCS-NEW, EVALUATION SCHEME** 

## PROPOSED (W.E.F. SESSION 2020-21)

## B. TECH. FIRST YEAR (SEMESTER- I)

(Common for CH, CE, IPE, ME)

S.No.	COURSE No.	SUBJECT	PE	RIOD	S	E	ALUA' SCHEN		CREDITS
5	COORDE NO.	505,201	L	Т	Р	IA	ESE	SUB- TOTAL	CILLDITS
THEO	RY								
1.	MA201TBS01	MATHEMATICS-I	3	1	-	30	70	100	4
2.	CY201TBS02	CHEMISTRY	3	1	-	30	70	100	4
3.	CE201TES01	ENGINEERING MECHANICS	le <b>%</b> C	oulse	-	30	70	100	4
4.	CS201TES02	COMPUTER PROGRAMMING	3	0	-	30	70	100	3
5.	CM201TES03	BASIC CIVIL & MECHANICAL ENGINEERING New Cours	e 3	0	-	30	70	100	3
6.	LW201TMC01	INDIAN CONSTITUTION New C	lo <b>@</b> se	0	-	-	-	-	-
		TOTAL	17	3	-	150	350	500	18
PRAC	TICALS								
1.	CY201PBS01	CHEMISTRY LAB	-	-	2	30	20	50	1
2.	CE201PES01	ENGINEERING MECHANICS LAB New Course	-	-	2	30	20	50	1
3.	CS201PES02	COMPUTER PROGRAMMING LAB	-	-	2	30	20	50	1
		TOTAL	-	-	6	90	60	150	3
		GRAND TOTAL	17	3	6	240	410	650	21

L:LECTURE, T:TUTORIAL, P:PRACTICAL, IA : INTERNAL ASSESSMENT, ESE:END SEMESTER EXAMINATION \*INTERNAL ASSESSMENT- Two Class Test of 15 Marks each will be conducted.

Total Contact Hours:26

Total Marks:650

Total Credits:21



### SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.) (A CENTRAL UNIVERSITY)

**CBCS-NEW, EVALUATION SCHEME** 

## PROPOSED (W.E.F. SESSION 2020-21)

## B. TECH. FIRST YEAR (SEMESTER- II)

### (Common for CH, CE, IPE, ME)

S. No.	COURSE No.	SUBJECT	PE	RIOI	os	EV	CREDITS		
5. 110.	COURSE NO.	L	т	Р	IA	ESE	SUB- TOTAL	CILLDITS	
THEO	RY								
1.	MA202TBS03	MATHEMATICS-II	3	1	-	30	70	100	4
2.	PH202TBS04	PHYSICS	3	1	-	30	70	100	4
3.	EC202TES04	BASIC ELECTRICAL & ELECTRONICS ENGINEERING	3	1	-	30	70	100	4
4.	IT202TES05	INTRODUCTION TO INFORMATION TECHNOLOGIES	2	0	-	30	70	100	2
5.	EN202THS01	ENGLISH COMMUNICATION	3	0	-	30	70	100	3
		TOTAL	14	3	-	150	350	500	17
PRAC	TICALS								
1.	PH202PBS02	PHYSICS LAB	-	-	2	30	20	50	1
2.	ME202PES03	ENGINEERING GRAPHICS	1	-	3	30	20	50	3
3.	ME202PES04	WORKSHOP TECHNOLOGY & PRACTICES	1	-	2	30	20	50	2
4.	EC202PES05	BEE LAB	-	-	2	30	20	50	1
		TOTAL	2	-	9	120	80	200	7
		GRAND TOTAL	16	3	9	270	430	700	24

Total Credits:24

Total Contact Hours:28

Total Marks:700

L:LECTURE, T:TUTORIAL, P:PRACTICAL, IA : INTERNAL ASSESSMENT, ESE:END SEMESTER EXAMINATION \*INTERNAL ASSESSMENT- Two Class Test of 15 Marks each will be conducted.



SYLLABUS	(SEMESTER-I)	Per We	iods/ ek		Internal	Assessm	ent (IA)	ESE	Grand Total	Credits
Subject Code:	MA201TBS01	L	Т	Р	CT-1	CT-II	TOTAL	70	100	04
Subject:	MATHEMATICS-I	3	1	-	15	15	30			

Course Content

Calculus (Single Variable)

90% Change

UNIT 1: Calculus: Evolutes and involutes; Evaluation of definite and improper integrals; Beta and

Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions. Asymptotes: definition, properties and problems. Rolle's Theorem, Mean value theorems, Taylor's and Maclaurin theorems with remainders; Indeterminate forms and L' Hospital's rule; Maxima and minima.

UNIT 2: Sequences and series: Convergence of sequence and series, tests for convergence, power series, and Taylor's series. Series for exponential, trigonometric and logarithmic functions; Fourier series: Half range sine and cosine series, Parseval's theorem.

UNIT-3: (A): Multi variable Calculus (Differentiation): Limit, continuity and partial derivatives, directional Derivatives, total Derivative; Tangent plane and normal line; Maxima, minima and saddle points; Method of Lagrange multipliers; Gradient, curl and divergence.

(B): Multivariable Calculus (Integration): Multiple Integration: double and triple integrals (Cartesian and polar), change of order of integration in double integrals, Change of variables (Cartesian to polar), Applications: areas and volumes by (double integration) Center of mass and Gravity (constant and variable densities). Theorems of Green, Gauss and Stokes, orthogonal curvilinear coordinates, Simple applications involving cubes, sphere and rectangular parallelepipeds.

UNIT - 4 (A): Matrices (in case vector spaces is not to be taught): Algebra of matrices, Inverse and rank of a matrix, rank-nullity theorem; System of linear equations; Symmetric, skew-symmetric and orthogonal matrices; Determinants; Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem, Orthogonal transformation and quadratic to canonical forms.

(B) Matrices (in case vector spaces is to be taught): Matrices, vectors: addition and scalar multiplication, matrix multiplication; linear systems of Equations, linear Independence, rank of a matrix, determinants, Cramer's Rule, inverse of a matrix, Gauss elimination and Gauss-Jordan elimination.

UNIT-5 (A): Vector spaces: Vector Space, linear dependence of vectors, basis, dimension; Linear transformations (maps), range and kernel of a linear map, rank and nullity, Inverse of a linear transformation, rank nullity theorem, composition of linear maps, Matrix associated with a linear map.

(B) Vector spaces: Eigenvalues, eigenvectors, symmetric, skew-symmetric, and orthogonal Matrices, eigenbasis. Diagonalization; Inner product spaces, Gram-Schmidt orthogonalization.

#### Textbooks/References:

- 1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
- 2. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
- 3. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11 Reprint, 2010.
- 4. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.

गुरू घासीदास विश्वविद्यालय (केन्रीय विश्वविद्यालय अधिन्यम 2009 क्र. 25 के अंतर्गत स्वापित केन्न्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



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### B. TECH. FIRST YEAR SYLLABUS (W.E.F SESSION 2020-21)

SY	LLABUS	Periods/	Periods/ Week			Internal	Assessm	ent ( IA)	ESE	Grand Total	Credits
_	bject ode:	MA202TBS03	L	Т	Р	CT-1	CT-II	TOTAL	70	100	4
Su	bject:	MATHEMATICS-II	3	1	-	15	15	30			

Course Content:

### 90% Change

UNIT 1: First order ordinary differential equations: Exact, linear and Bernoulli's equations, Euler's equations, Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

**UNIT 2:** Ordinary differential equations of higher orders (Prerequisite 2c, 4a) second order linear differential equations with variable coefficients, method of variation of parameters, Cauchy-Euler equation; Power series solutions; Legendre polynomials, Bessel functions of the first kind and their properties.

UNIT 3: Partial Differential Equations – First order (Prerequisite 5a-b): First order partial differential equations, solutions of first order linear and non-linear PDEs.

UNIT 4: Partial Differential Equations- Higher order (Prerequisite 5b-c) Solution to homogenous and nonhomogenous linear partial differential equations second and higher order by complimentary function and particular integral method. Flows, vibrations and diffusions, second-order linear equations and their classification, Initial and boundary conditions (with an informal description of well-posed problems).

UNIT 5: D'Alembert's solution of the wave equation; Duhamel's principle for one dimensional wave equation. Separation of variables method to simple problems in Cartesian coordinates. The Laplacian in plane, cylindrical and spherical polar coordinates, solutions with Bessel functions and Legendre functions. One dimensional diffusion equation and its solution by separation of variables. Boundary-value problems: Solution of boundary- value problems for various linear PDEs in various geometries.

#### Textbooks/References:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

 W. E. Boyce and R. C. DiPrima, Elementary Differential Equations and Boundary Value Problems, 9th Edition, Wiley India, 2009.

3. S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.

4. E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall India, 1995.

E. L. Ince, Ordinary Differential Equations, Dover Publications, 1958.

6. G.F. Simmons and S.G. Krantz, Differential Equations, Tata McGraw Hill, 2007.

7. S. J. Farlow, Partial Differential Equations for Scientists and Engineers, Dover Publications, 1993.

8. R. Haberman, Elementary Applied Partial Differential equations with Fourier Series and Boundary

Value Problem, 4th Ed., Prentice Hall, 1998.

9. Ian Sneddon, Elements of Partial Differential Equations, McGraw Hill, 1964.

 Manish Goyal and N.P. Bali, Transforms and Partial Differential Equations, University Science Press, Second Edition, 2010

11. Denian murry, defferential equations , oxford publications



### B. TECH. FIRST YEAR SYLLABUS (W.E.F SESSION 2020-21)

SYLLABUS	(SEMESTER-II)	Periods/ Week		Internal Assessment (IA)			ESE	Grand Total	Credits	
Subject Code:	EC201TES01 / EC202TES04	L	Т	Р	CT-1	CT-II	TOTAL	70	100	04
Su <mark>bject:</mark>	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	3	1	-	15	15	30			

#### **Course Learning Objectives:**

- To impart a basic knowledge of electrical quantities such as current, voltage, power, energy and. To provide working knowledge for the analysis of basic DC circuits used in electrical and electronic devices.
- To provide working knowledge for the analysis of basic AC circuits used in electrical and electronic devices and measuring instruments
- To explain the working principle, construction, applications of Transformer, DC machines and AC machines.
- To make students understand basics of Diodes and Transistors.
- To impart knowledge about basics of Digital Electronics

Course Content:

#### UNIT-1: DC circuits (8 hours)

Electrical circuit elements (R, L and C), voltage and current sources, Ohm's Law, Kirchoff's current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits. Mesh & nodal analysis, Star-Delta transformation and circuits.

80% Change

#### UNIT-2: AC circuits (8 hours)

Representation of sinusoidal waveforms, average and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections. Three-phase power measurement- Two-Wattmeter method.

Construction and working principle of single-phase wattmeter and energy meter. Introduction to Sensors and Transducers.

#### UNIT-3: Electrical machines (8 hours)

Construction, classification, ideal and practical transformer, equivalent circuit, losses in transformers, tests, voltage regulation and efficiency.

Construction, Working Principle, losses and efficiency of DC Machines and three phase Induction Machine, DC motor.

#### UNIT-4: Semiconductor devices And application (8 hours)

Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics – Half wave and Full wave Rectifiers – Voltage Regulation. Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics.

UNIT 5: Digital Electronics (8 hours)

Binary Number System, Logic Gates, Combinational circuits, Boolean Algebra, De Morgan's Theorem, Half and Full Adders, Flip- Flops. Sequential circuits-Registers and Counters, A/D a D/A Conversion.

#### Suggested Text / Reference Books:

(i) D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
(ii) D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
(iii) B L Theraja and AK Theraja," A Textbook of Electrical Technology- Vol-I & II, S. CHAND & 2013.
(iv) E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
(v) Jacob Millman, Christos Halkias,, Chetan Parikh, "Millman's Integrated Electronics - Anal Digital Circuit and Systems", 2nd Edition 2017
(vi) Robert L Boylestad, Louis Nashlsky," Electronics devices and circuit theory", Pearson 11<sup>th</sup> 2013

(vii) M. Morris Mano," Digital Logic and Computer Design", Pearson, 2004.

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### B. TECH. FIRST YEAR SYLLABUS (W.E.F SESSION 2020-21)

SYLLABUS	(SEMESTER-II)	Periods/ Week			INTERN. (IA)	AL ASSES	ESE	Grand total	Credits	
Subject Code:	ME201PES01/ ME202PES03	L	Т	Р	IA	MSE	TOTAL	20	50	3
Subject:	ENGINEERING GRAPHICS	1	0	3	30		30			

Course Learning Objectives:

### 30% Change

- To learn the basic of Engineering Drawing and Orthographic Projections
   To learn the Sections and Sectional Views of Right Angular Solids
- · To learn the Isometric Projections covering and overview of Computer Graphics

UNIT 1: Introduction Engineering Graphics and Engineering Curves: Principles of engineering graphics and their significance – drawing instruments and their use – conventions in drawing – lettering – BIS conventions. Dimensioning rules, geometrical construction. Engineering Curves - Conic Sections, Special Curves-Cycloids, Epicycloids, Hypocycloids, Involutes and trochoid.

UNIT 2: Projection of Points, Straight lines and Planes: Principles of orthographic projections – conventions – first and third angle projections. Projections of points and lines inclined to both the planes. Projections of regular planes, inclined to both planes

UNIT 3: Projections Solids: Introduction, Type of solid, Projections of solids in simple position, Projection of solids with axes inclined to one of the reference planes and parallel to the other, Projections of solids with axes inclined to both H.P. and the V.P.

UNIT 4: Section of Solids and Development of Surfaces: Sectioning of regular solids - Section planes perpendicular to one plane and parallel or inclined to other plane - Development of surfaces of right, regular solids - development of prisms, cylinders, pyramids, cones and their parts.

UNIT 5: Isometric Projections and Orthographic Views: Principles of Isometric Projections-Isometric Scale- Isometric Views Conventions-Plane Figures, Simple and Compound Solids. Conversion of isometric views to orthographic views. Conversion of orthographic views to isometric projections, vice-versa. Introduction to perspective projection.

Computer Aided Drafting: Introduction to computer aided drafting package to make 2-D drawings. Demonstration purpose only - not to be included in examinations.

### Textbooks/References:

- 1. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House
- 2. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, PearsonEducation
- 3. Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication
- 4. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers
- 5. CAD Software Theory and User Manuals

### **Course Outcomes:**

- 1. At the end of the course, the student shall be able to
- 2. Draw engineering curves, orthographic projections of lines, planes and solids.
- 3. Draw sections of solids including cylinders, cones, prisms and pyramids.
- 4. Make development of surfaces, Orthographic and Isometric projections
- 5. Overview of Computer Graphics.

गुरू घासीदास विश्वविद्यालय (केन्रीय विस्तविद्यालय अधिनेयम 2009 क. 25 के अंतर्गत स्वापित केन्द्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya (A Central University Established by the Central Universities Act 2009 No. 25 of 2009) Koni, Bilaspur – 495009 (C.G.)

40% Change

### B. TECH. FIRST YEAR SYLLABUS (W.E.F SESSION 2020-21)

SYLLABUS	(SEMESTER-II)	Periods/ Week		INTERN (IA)	IAL ASSE	SSMENT	ESE	Grand total	Credits	
Subject Cade:	EC201PES03/ EC202PES05	L	Т	Р	IA	MSE	TOTAL			
s e Subject: L	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB	-	-	2	30		30	20	50	1

e

### Course Learning Objectives:

To understand basic electrical wiring, measurements, errors and method.

To practically provide the concept of different theorems.

• To have actually hands-on on machines like transformers, DC and AC machines to get better understanding.

To get experimental knowledge of Diodes and Transistors

To make students learn Digital logic design.

#### Course Content: List of experiments/demonstrations:

1. Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real-life resistors, capacitors and inductors.

 Measuring the steady-state and transient time-response of R-L, R-C, and R-L-C circuits to a step change in voltage (transient may be observed on a storage oscilloscope).

3. Sinusoidal steady state response of R-L, and R-C circuits – impedance calculation and Verification. Observation of phase differences between current and voltage. Resonance in R-L-C circuits.

4. Transformers: Polarity test, OC & SC tests. Loading of a transformer: measurement of primary and secondary voltages and currents and power.

 Demonstration of cut-out sections of machines: dc machine (commutator-brush arrangement), induction machine (squirrel cage rotor), and single-phase induction machine.

6. Study of Diodes and transistors characteristics.

7. Study of full-wave and half-wave rectifier.

8. Verification of De Morgan's theorems.

Study of Logic gates.

10. Study of half and full adder.

Course Outcomes: At the end of the course students will be able to:

 Acquire knowledge about different types of meters and take readings and Construct circuits and measure different electrical quantities.

 Analyze Single Phase and Three phase AC Circuits, the representation of alternating quantities and determining the power in these circuits

- Work on machines like transformers
- Acquire knowledge about different types of diodes and transistors
- Design and understand digital logic circuits