



List of Revised Courses

Department : **Civil Engineering**

Program Name : **B.Tech.**

Academic Year : **2019-20**

List of Revised Courses

Sr. No.	Course Code	Name of the Course
01.	CE03TBS05	ENGINEERING MATHEMATICS-III
02.	CE03TPC04	SURVEYING & GEOMATICS
03.	CE04THS04	ENGINEERING ECONOMICS



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

Academic Year : 2019-20

School : School of Studies of Engineering and Technology

Department : Civil Engineering

Date and Time : June 29, 2019 - 03:30 PM

Venue : Department of Civil Engineering

**Department of Civil Engineering
School of Studies, Engineering & Technology
Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur C.G.**

Minutes of Meeting of BoS

A meeting of Board of Studies (BoS) of Civil Engineering was held on 29-06-2019 at 03.30 PM in the Department of Civil Engineering to discuss and finalize the scheme and syllabus of B.Tech. course w.e.f 2019-20 session. The following DRC members were present.

1. Dr. M. C. Rao, Chairman BoS, Head of the Department Civil Engg.
2. Dr. Shailendra Kumar, Professor, Civil Engg. Dept., GGV, member of BoS
3. Shri. Sunil Kumar Shrivastava, Chief Manager (Civil), SECL Bilaspur, Industry Expert and member of BoS
4. Shri.R.K. Choubey, Asso. Professor, Civil Engg. Dept., GGV, member of BoS

At the outset the chairman welcomed all the esteemed members.

The draft of the Scheme & Evaluation for B.Tech. 3rd to 8th Semester and the detail syllabus of B.Tech. 2nd year (3rd & 4th semester) Civil Engineering was prepared as per the model Scheme and Syllabus of AICTE 2018. The Chairman of BoS informed the members of BoS that the VC nominee and external member Prof. U.K.Dewangan, Head Civil Engg. Dept., NIT Raipur could not attend the meeting due to his pre-occupied academic assignments at NIT Raipur. Also, Mr. A.K.Parashar, member of BoS could not be present as he is out of station to attend the GIAN course at NIT Jaipur. However, both the members have gone through the proposed scheme and syllabus and have sent their comments through e-mail. Accordingly members discussed and incorporated the desired modifications.

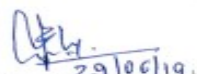
The BoS approved the above Scheme & Evaluation for B.Tech. 3rd to 8th Semester and the detail syllabus of B.Tech. 2nd year (3rd & 4th semester) Civil Engineering and recommended to be made effective from session 2019-20.

The meeting ended with vote of thanks.


Dr. M. C. Rao


Prof. Shailendra Kumar


S. K. Shrivastava


R.K. Choubey



The following revisions were introduced in the of B.Tech. 2nd year (3rd & 4th semester) scheme and syllabi :

- ❖ ENGINEERING MATHEMATICS-III (CE03TBS05)
- ❖ SURVEYING & GEOMATICS (CE03TPC04)
- ❖ ENGINEERING ECONOMICS (CE04THS04)

The following new courses were introduced in the of B. Tech. 2nd year (III and IV Semesters):

- ❖ INDIAN CONSTITUTION (CE03THS03)
- ❖ CONCRETE TECHNOLOGY (CE04TPC05)
- ❖ PROFESSIONAL PRACTICE, LAW & ETHICS (CE04THS05)
- ❖ EFFECTIVE TECHNICAL COMMUNICATION (CE04THS06)
- ❖ EFFECTIVE TECHNICAL COMMUNICATION LAB (CE04PHS01)

विभागाध्यक्ष
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Department of Civil Engineering,
प्रो.स.गु.घा.विश्वविद्यालय, बिलासपुर (छ.ग.)
I.T., G.G.V. Bilaspur (C.G.)

Signature & Seal of HoD



Scheme and Syllabus

CIVIL ENGINEERING DEPARTMENT, SOS, ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA (A CENTRAL UNIVERSITY), BILASPUR

SCHEME OF B.TECH. III SEMESTER CIVIL ENGINEERING
W.E.F. 2019-20 (ODD SEMESTER)

S. No	Subject Code	Subjects	Period/Week			Scheme of Evaluation				Grand Total	Credits
						Internal Assessment (IA)			ESE		
						CT-I	CT-II	Total			
		Theory	L	T	P						
1	CE03TBS05	Engineering Mathematics-III	3	1	0	15	15	30	70	100	4
2	CE03TPC01	Strength of Materials	3	1	0	15	15	30	70	100	4
3	CE03TPC02	Fluid Mechanics-I	3	0	0	15	15	30	70	100	3
4	CE03TPC03	Building Materials & Construction	3	0	0	15	15	30	70	100	3
5	CE03TPC04	Surveying & Geomatics	3	0	0	15	15	30	70	100	3
6	CE03THS03	Indian Constitution*	2	0	0	-	-	-	-	-	0
		Practical									
1	CE03PPC01	Survey Lab	0	0	3	-	-	30	20	50	1.5
2	CE03PPC02	Fluid Mechanics Lab	0	0	3	-	-	30	20	50	1.5
1	CE03PES06	Computer Aided Civil Engg. Drawing	0	0	3	-	-	30	20	50	1.5
										Total Credits	21.5

L - Lecture Hours, T-Tutorial Hours, P - Practical Hours, CT - Class Test, ESE - End Semester Exam; * Mandatory Course



CIVIL ENGINEERING DEPARTMENT, SOS, ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA (A CENTRAL UNIVERSITY), BILASPUR

SCHEME OF B.TECH. IV SEMESTER CIVIL ENGINEERING
W.E.F. 2019-20 (EVEN SEMESTER)

S. No	Subject Code	Subjects	period/Week			Scheme of Evaluation				Grand Total	Credits
						Internal Assessment (IA)			ESE		
						CT-I	CT-II	Total			
		Theory	L	T	P						
1	CE04THS04	Engineering Economics	3	0	0	15	15	30	70	100	3
2	CE04TPC05	Concrete Technology	3	0	0	15	15	30	70	100	3
3	CE04THS05	Professional Practice, Law & Ethics	2	0	0	15	15	30	70	100	2
4	CE04TPC06	Structural Analysis-I	3	1	0	15	15	30	70	100	4
5	CE04TPC07	Fluid Mechanics-II	3	0	0	15	15	30	70	100	3
6	CE04THS06	Effective Technical Communication	3	0	0	15	15	30	70	100	3
		Practical									
1	CE04PHS01	Effective Technical communication lab	0	0	2	-	-	30	20	50	1
2	CE04PPC03	Material Testing Lab	0	0	3	-	-	30	20	50	1.5
										Total Credits	20.5

L - Lecture Hours, T-Tutorial Hours, P - Practical Hours, CT - Class Test, ESE – End Semester Exam;



DEPARTMENT OF CIVIL ENGINEERING B.TECH. SECOND YEAR SYLLABUS W.E.F 2019-20

SYLLAUS	(SEMESTER-III)	Periods/Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-1	CT-II	TOTAL			
Subject Code:	CE03TBS05							70	100	4
Subject:	Engineering Mathematics-III	3	1	0	15	15	30			

Course Learning Objectives:

Course Learning Objectives:

The students will be able to use of the concepts of correlation, Regression and various types of distributions. To provide students with the skills, knowledge and attitudes required to determine approximate numerical solutions to mathematical problems which cannot always be solved by conventional analytical techniques, and to demonstrate the importance of selecting the right numerical technique for a particular application, and carefully analysing and interpreting the results obtained.

Course Content:

UNIT-1 Correlation & Regression: Scatter diagram, Linear Correlation, Measures of Correlation. Karl Pearson's Coefficient of correlation, Limits for correlation coefficients, Coefficient of correlation for vicariate frequency distribution, Rank correlation, Linear Regression, Equations to the line of Regression. Regression coefficient. Angle between two lines of Regression.

UNIT-2 Theoretical Distributions: Discrete and Continuous probability distribution's .Mathematical expectation, Mean and Variance, Moments, Moments generating function, probability distribution ,Binomial, Poisson and Normal distribution ,Test of significance based on chi-square , T,F, and Z distribution, degree of freedom , conditions for applying X² (chi-square) test , student's test.

UNIT-3 Introduction of Errors and their Analysis, types of errors, numerical problems on error analysis, curve fitting: method of least squares; Numerical Solution of Algebraic and Transcendental Equations: Graphical method bisection Method, Secant Method, Regula-falsi Method, Newton Raphson Method.

UNIT- 4 The Calculus of Finite Differences: Finite differences, Difference formula, operators and relation between operators. Inverse Operator, Interpolation with equal intervals: - Newton's forward and backward interpolation formula. Interpolation with Unequal intervals: - Lagrange's interpolation Newton's difference formula, inverse interpolation.

UNIT- 5 Numerical Differentiation and Integration: - Numerical Differentiation Newton's forward and Backward difference interpolation formula. Maxima and Minima of a Tabulated function, Numerical Integration :-Trapezoidol rule, simpson's (1/3) rd and (3/8) th rule, Boole's rule, weddle rule.

Text Books:

- 1) Prasad C "Advanced Engineering mathematics",
- 3) Dass H.K. "Advanced Engineering mathematics",
- 4) Ray M. "Mathematics statistics",
- 5) HigherEngg. Mathematics by Dr. B.S. Grewal- KhannaPublishers.,
- 6) Advanced Engg. Mathematics by Erwin Kreyszig - John Wiley & Sons,
- 7) Advanced Engg. Mathematics by R.K. Jain and S.R.K. Iyengar - Narosa Publishing House.,
- 8) Applied Mathematics by P.N.Wartikar& J.N. Wartikar. Vol- II- Pune VidyarthiGrihaPrakashan,Pune.,
- 9) JAIN & IYNGAR Numerical Methods for Scientific and Engineering Computations.



DEPARTMENT OF CIVIL ENGINEERING B.TECH. SECOND YEAR SYLLABUS W.E.F 2019-20

- 10) RAO G.S. Numerical Analysis.
- 11) Grewal B S Numerical Methods In Engineering and Science.
- 12) Rajaraman V Computer Oriented Numerical Methods
- 13) P. Kandasamy K. Thilagavathy, K. Gunavathi, Numerical Methods, S. Chand & Company, 2nd Edition, Reprint 2012.
- 14) S. S. Sastry, Introduction methods of Numerical Analysis, PHI, 4th Edition, 2005.

Course Outcomes-

After successful completion of this course, the students will be able to

- Understand the statistical concept of correlation regression and distribution, theory with special reforms to engineering problems.
- Analyse the errors obtained in the numerical solution of problems.
- Using appropriate numerical methods, determine the solutions to given non-linear equations.
- Using appropriate numerical methods, determine approximate solutions to systems of linear equations.
- Using appropriate numerical methods, determine approximate solutions to ordinary differential equations.

SYLLAUS	(SEMESTER-III)	Periods/Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-1	CT-II	TOTAL			
<i>Subject Code:</i>	CE03TPC01							70	100	04
<i>Subject:</i>	Strength of Materials	3	1	0	15	15	30			

Course Learning Objectives:

The objective of this Course is to

- To determine the Mechanical behavior of the body by determining the stresses, strains produced by the application of load.
- To apply the fundamentals of simple stresses and strains.
- To facilitate the concept of bending and its theoretical analysis.
- To apply fundamental concepts related to deformation, moment of inertia, load carrying capacity, shear forces, bending moments, torsional moments, column, principal stresses and strains.

Course Content:

UNIT-1: Simple Stresses -Strain and compound stresses: Types of stresses and strains, Mechanicals properties, Hooke's law, stress- strain curve for mild & Cast iron, hardness, impact strength, Poisson's ratio, Relation between the elastic moduli & Poisson's ratio, Bars subjected to varying loads, Temperature stresses in composite bars, Elongation of bars of constant and varying sections. Stress at a point. Components of stress in rectangular coordinates, stresses on an inclined plane, Principal stresses & principle plane, Mohr's circle of stresses.

UNIT-2: Shear Force - Bending Moment: Shear Force & Bending Moment diagrams in statically determinate beams loaded with different load combination, Relationship between Load intensity- Shear Force - Bending Moment, Thrust diagram, Point of contra flexure, loading diagram & Bending moment diagram from shear force diagram, beam with internal hinge. Bending Stress



DEPARTMENT OF CIVIL ENGINEERING B.TECH. SECOND YEAR SYLLABUS W.E.F 2019-20

SYLLAUS	(SEMESTER-III)	Periods / Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE03TPC04							70	100	03
Subject:	Surveying & Geomatics	3	0	0	15	15	30			

Course Learning Objectives:

- To understand the basic principles of surveying of linear & elevated measurements i.e. chain survey, levelling etc.
- To expertise in surveying instrument like Compasses, theodolite & Total station etc.
- To learn the subsidiary surveying like photographic & hydrographic surveying
- To learn the advanced application of surveying like Remote sensing, EDM

Course Content:

Unit 1: Introduction to Surveying : Definition - Principles - Classification - Scales - Ranging and chaining - Reciprocal ranging .COMPASS SURVEYING: Prismatic compass - Surveyor's compass - Bearing - Systems and conversions - Local attraction – Magnetic declination - Dip .
LEVELLING: Principle of levelling, Different methods of determining elevations. Temporary and permanent adjustment of levels. Sensitivity of bubble tube, Levelling staff, Types of levelling: - Reciprocal, Profile, Differential, Plotting of profiles Correction: - Curvature and refraction.

Unit 2: Theodolite and Traversing: Vernier theodolites, Temporary and permanent adjustments, Requirements of nonadjustable parts, Measurement of horizontal angle by repetition and reiteration method, Measurement of vertical angles.
TACHEOMETRY: Definitions, Principles of stadia systems. Instrument constants, Substance and Tangential Systems. Construction and use of Reduction Tacheometers.
CONTOURING; Introduction to contouring.

Unit 3: Triangulation: Principle and classification of Triangulation System, Strength of Figures, Station marks and Signals, Satellite station, intersected and Resected points.

Plane Table Surveying: Principles, Advantages and disadvantages, Plane table equipment, Use of Telescopic Alidade, Different methods of Plane Table Surveying.

Unit 4: PHOTOGRAPHIC SURVEYING: Photo theodolite, principle of the method of terrestrial photogrammetry, scale and distortion of the vertical and tilted photograph. **HYDROGRAPHIC SURVEYING:** Introduction, shore line survey, soundings methods

Unit 5: (A) Principle of Electronic Distance Measurement: Principle, Type, Use ,Measurement, Modulation, Types of EDM instruments, Distomat, **Total Station – Parts of a Total Station – Accessories – Advantages and Applications.**

(B) Remote Sensing: Introduction –Electromagnetic Spectrum, interaction of electromagnetic radiation with the atmosphere and earth surface, remote sensing data acquisition: platforms and sensors.

Text/Reference Books:

- 1 Madhu, N, Sathikumar, R and Satheesh Gobi, Advanced Surveying: Total Station, GIS and Remote Sensing, Pearson India, 2006.
- 2 Manoj, K. Arora and Badjatia, Geomatics Engineering, Nem Chand & Bros, 2011
- 3 Bhavikatti, S.S., Surveying and Levelling, Vol. I and II, I.K. International, 2010



DEPARTMENT OF CIVIL ENGINEERING B.TECH. SECOND YEAR SYLLABUS W.E.F 2019-20

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

- To apply the knowledge, techniques, basics, and instruments of the discipline to engineering and surveying activities
- Explain different methods and their procedure for levelling
- Explain the working principles of various surveying instruments
- To relate the knowledge on Surveying to the new frontiers of science like Hydrographic surveying, Electronic Distance Measurement, Global Positioning System, Photogrammetry and Remote Sensing.

SYLLAUS	(SEMESTER-III)	Periods/Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
<i>Subject Code:</i>	CE03THS03							-	-	00
<i>Subject:</i>	Indian Constitution	2	0	0	-	-	-			

Course Learning Objectives:

- To the importance of preamble of the constitution of India.
- To understand the fundamental rights and duty as a citizen of India.
- To understand the functioning of union and state government and their inter-relationship.

Course Content:

UNIT 1: Introduction: Constitution-meaning of the term, Sources and constitutional theory, Features, Citizenship. Preamble.

UNIT 2: Fundamental Rights and Duties: Fundamental Rights, Fundamental Duties, Directive Principles of State Policy

UNIT 3: Union Government: Structure of Indian Union: Federalism, Centre-State relationship President: Role. Power and position, Prime Minister and council of ministers, Cabinet and Central Secretariat, Lok Sabha. Rajya Sabha

UNIT 4: State Government: Governor: Role and position, Chief Minister and council of ministers, State Secretariat

UNIT 5: Relationship between Centre and States: Distribution of Legislative Powers, Administrative Relations, Coordination between States

Text Books:

1. Constitution of India, V.N. Shukla
2. The Constitutional Law of India, J.N. Pandey
3. Indian Constitutional Law. M.P. Jain

Outcome: At the end of the course students will be able to:

- Describe the salient features of the Indian Constitution
- List the Fundamental Rights and Fundamental Duties of Indian citizens
- Describe the Directive Principles of State Policy and their significance



DEPARTMENT OF CIVIL ENGINEERING B.TECH. SECOND YEAR SYLLABUS W.E.F 2019-20

SYLLAUS	(SEMESTER-III)	CREDITS: 3			INTERNAL ASSESSMENT (IA)			ESE
		L	T	P	IA	MSE	TOTAL	
<i>Subject Code:</i>	CE03PES06							
<i>Subject:</i>	Computer Aided Civil Engg. Drawing	0	0	3	30	0	30	20

Course objectives:

- To develop the capability to draw the basic detailed elements of structures like truss, beam, column etc. using Auto CAD
- To develop the capability to draw plan, section of residential building using Auto CAD
- To develop the capability to draw plan, section of public building using Auto CAD

Course Content:

List of Experiments:

1. Basic drawing for symbols used in building drawing
2. Drawing of different Foundation
3. Drawing of different masonry wall
4. Drawing of masonry bonds
5. Drawing of trusses
6. Drawing of retaining Wall
7. Drawing of Stair case, Doors and Windows
8. Plan, elevation and section of Residential Building
9. Plan, elevation and section of Public Building like school, college etc.
10. Detailing of beam, column and slab

Text Books / References:

1. N Krishna Raju, Structural Design and Drawing, Second Edition, Universities Press (India), Private Limited, Hyderabad, 2009
2. AutoCAD Essentials, Autodesk official Press, John Wiley & Sons, US, 2015

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

- To draw planning and detailing of residential building with the help of Auto CAD software
- To draw other Civil Engineering structures with the help of Auto CAD software

SYLLAUS	(SEMESTER-IV)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
<i>Subject Code:</i>	CE04THS04									
<i>Subject:</i>	Engineering Economics	3	0	0	15	15	30	70	100	03

Course Learning Objectives:

To learn about the basics of economics and cost analysis related to engineering so as to take economically sound decisions

Course Content:

UNIT I: Introduction to Economics



DEPARTMENT OF CIVIL ENGINEERING B.TECH. SECOND YEAR SYLLABUS W.E.F 2019-20

Introduction to Economics- Flow in an economy, Law of supply and demand, Concept of Engineering Economics – Engineering efficiency, Economic efficiency, Scope of engineering economics- Element of costs, Marginal cost, Marginal Revenue, Sunk cost, Opportunity cost, Break-even analysis- V ratio, Elementary economic Analysis – Material selection for product Design selection for a product, Process planning.

UNIT 2: Value Engineering

Make or buy decision, Value engineering – Function, aims, Value engineering procedure. Interest formulae and their applications –Time value of money, Single payment compound amount factor, Single payment present worth factor, Equal payment series sinking fund factor, Equal payment series payment Present worth factor, Equal payment series capital recovery factor-Uniform gradient series annual equivalent factor, Effective interest rate, Examples in all the methods.

UNIT 3: Cash Flow

Methods of comparison of alternatives – present worth method (Revenue dominated cash flow diagram), Future worth method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), Annual equivalent method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), rate of return method, Examples in all the methods.

UNIT 4: Replacement and Maintenance Analysis

Replacement and Maintenance analysis – Types of maintenance, types of replacement problem, determination of economic life of an asset, Replacement of an asset with a new asset – capital recovery with return and concept of challenger and defender, Simple probabilistic model for items which fail completely.

UNIT 5: Depreciation

Depreciation- Introduction, Straight line method of depreciation, declining balance method of depreciation- Sum of the years digits method of depreciation, sinking fund method of depreciation/ Annuity method of depreciation, service output method of depreciation-Evaluation of public alternatives- introduction, Examples, Inflation adjusted decisions – procedure to adjust inflation, Examples on comparison of alternatives and determination of economic life of asset.

TEXT BOOKS:

1. Panneer Selvam, R, —Engineering EconomicsI, Prentice Hall of India Ltd, New Delhi, 2001.
2. Suma Damodaran, — Managerial economicsI, Oxford university press 2006.

REFERENCES:

1. Chan S.Park, —Contemporary Engineering EconomicsI, Prentice Hall of India, 2002.
2. Donald.G. Newman, Jerome.P.Lavelle, —Engineering Economics and analysisI Engg. Press, Texas, 2002
3. Degarmo, E.P., Sullivan, W.G and Canada, J.R, —Engineering EconomyI, Macmillan, New York, 1984
4. Grant.E.L., Ireson.W.G., and Leavenworth, R.S, —Principles of Engineering EconomyI, Ronald Press, New York,1976.
5. Smith, G.W., —Engineering EconomyI, Iowa State Press, Iowa, 1973.
6. Truett & Truett, — Managerial economics- Analysis, problems & cases — Wiley India 8 Th edition 2004.
7. Luke M Froeb / Brian T Mccann, — Managerial Economics – A problem solving approachI Thomson learning 2007.

Outcome: At the end of the course students will be able

- To understand the basic economic principles of wants, scarcity, choice, opportunity cost; etc has applied to business organizations and engineering firms. Understand the time value of money and how to sketch the cash flow diagram.