

# GONDWANA UNIVERSITY, GADCHIROLI

## TEACHING AND EXAMINATION SCHEME (SEMESTER PATTERN CHOICE BASED CREDIT SYSTEM)

PROGRAM : MASTER OF TECHNOLOGY IN Structural Engineering and Construction PROGRAM CODE:PSE

BoS: Civil Engineering FACULTY:ENGINEERING & TECHNOLOGY DURATION: TWO YEARS

### I – SEMESTER

Unique Subject Code (USC)	Course type	Subject	Teaching Scheme				Examination Scheme									
			Hours per week			No. of Credits	Theory						Practical			
			L	Field Work/ Assignment/ Tutorial	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
									Sessional							
ESE	MSE	IE	TW	PEE												
PSES11	C	Matrix analysis of structures	3	1	-	3+1	4	70	10	20	100	50	-	-	-	-
PSES12	C	Advanced concrete structures	3	1	-	3+1	4	70	10	20	100	50	-	-	-	-
PSES13	C	New construction materials	2	1	-	2+1	3	70	10	20	100	50	-	-	-	-
PSES14	C	Building services	2	1	-	2	3	70	10	20	100	50	-	-	-	-
PSES15x	P	Elective – I	3	1	-	3+1		70	10	20	100	50				
<b>Laboratories/ Practical</b>																
PSES16	C	Matrix analysis of structures	-	-	2	1	-	-	-	-	-	-	50	50	100	50
<b>TOTAL</b>			13	05	2	18	-	<b>500</b>					<b>100</b>			
<b>SEMESTER TOTAL</b>			<b>20</b>			<b>18</b>	<b>600</b>									

**Elective-I(x)—a. Structural instrumentation and material science b. Computational Techniques.c.Optimization Techniques in Structural Engineering**

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### II – SEMESTER

Unique Subject Code (USC)	Course type	Subject	Teaching Scheme				Examination Scheme										
			Hours per week			No. of Credits	Duration of Paper (Hrs.)	Max. Marks	Theory			Total	Min. Passing Marks	Practical			
			L	Field Work/ Assignment/ Tutorial	P				Max. Marks	Sessional				Max. Marks	Max. Marks	Total	Min. Passing Marks
										ESE	MSE						
PSES21	C	Finite Element Method	3	1	-	3+1	4	70	10	20	100	50	-	-	-	-	
PSES22	C	Structural dynamics	3	1	-	3+1	3	70	10	20	100	50	-	-	-	-	
PSES23	C	Design of substructures	2	1	-	2	3	70	10	20	100	50	-	-	-	-	
PSES24	C	Advanced construction management & Technology	2	1	-	2	3	70	10	20	100	50	-	-	-	-	
PSES25x	P	Elective – II	3	1	-	3+1	3	70	10	20	100	50					
<b>Laboratories/ Practical</b>																	
PSES26	C	Structural dynamics and instrumentation lab	-	-	2	1	-	-	-	-	-	-	25	25	50	25	
PSES27	E	Seminar*	-	-	2	1							50	-	50	25	
<b>TOTAL</b>			13	05	4	18	-	500					100				
<b>SEMESTER TOTAL</b>			22			18	600										

Elective II(x) a. Computer Aided Design in Structural Engineering (CAD)b. advanced design of steel structuresc. Plastic Analysis and Design.

\*Spiral binded copy of seminar delivered on advanced topic related to this course, must be submitted to the department

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### III – SEMESTER

Unique Subject Code (USC)	Course type	Subject	Teaching Scheme				Examination Scheme										
			Hours per week			No. of Credits	Theory					Practical					
			L	Field Work/ Assignment/ Tutorial	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks			Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
									Sessional								
			ESE	MSE	IE	TW		PEE									
PSES31	C	Design of Earthquake resisting RCC Structures	4	2	-	4+1	4	70	10	20	100	50	-	-	-	-	
PSES32(x)	P	IDCS	4	2	-	4+1	3	70	10	20	100	50	-	-	-	-	
<b>Laboratories/ Practical</b>																	
PSES33	C	Computer aided analysis- lab	-	-	4	2	-	-	-	-	-	-	50	50	100	50	
PSES34	E	Project Phase I and Seminar	-	-	12	6							50	50	100	50	
<b>TOTAL</b>			8	4	12	18	-	200					200				
<b>SEMESTER TOTAL</b>																	
			24			18	400										

**IDCS-I(x)** : a. Quality and safety in construction      b. Data structure and algorithm      c. Neuro network and fuzzy logic  
 d. Research Methodology

Note: for PSES34- Student should carry out following work for Phase-I of Project

1. Extensive literature survey and finalization of topic
2. Submission of Synopsis in the form of spiral binding
3. Data collection and analysis (partial)
4. Final submission seminar on PPT for Internal and External both. Total work carried in Phase-I must be submitted in Hard copy.  
Student has to submit the report and deliver the seminar based on Dissertation topic. It is to be evaluated by three member's panel of examiners headed by HOD; wherein guide should be one of the members of the panel. Last date of submission of report shall be one week before the end of semester.

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### IV – SEMESTER

Unique Subject Code (USC)	Course type	Subject	Teaching Scheme				Examination Scheme									
			Hours per week			No. of Credits	Theory					Practical				
			L	Field Work/ Assignment/ Tutorial	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
						Sessional										
ESE		MSE	IE	TW		PEE										
<b>Laboratories/ Practical</b>																
PSES41	E	Project Phase-II and Dissertation	-	-	24	18	-	-	-	-	-	-	200	200	400	400
<b>TOTAL</b>				-	24	18	-						<b>400</b>			
<b>SEMESTER TOTAL</b>				<b>24</b>		<b>18</b>							<b>400</b>			

**Note:**

- i) Dissertation work should be carried out on any recent topic decided in project phase-I, which has not been carried out earlier by any alumni. If it is found at any stage then it will be rejected without any clarification.
- ii) At least one research paper should be published in research journal having ISSN number and impact factor more than 0.75.
- iii) Those candidates completing the dissertation without publishing research paper, will be evaluated from total marks out of 160 (160TW + 160PEE) only.

**PSES31:DESIGNOF EARTHQUAKE RESISTINGR.C.STRUCTURES**

**Teaching scheme: 03 L+01 T=04**

**Credit:04**

**Evaluationscheme: 20IE+10 MSE+70 ESE**

**Totalmarks: 100**

**DurationofESE: 4 Hrs.**

**Objective:**

Aftercompletion ofsyllabus students willable to

1. Understand the behaviorofstructuressubjectedtolateralloads.
2. Understand design aspects ofRCCand Steelmembers subjected toearthquake loads.
3. Understand detailingofRCCand steelmembers forductile behavioras percodalprovisions.

**UNIT – I**

Earthquake, windand other(i.e. blast, snow) load calculations alongwith deadload andlive loads and theircombinations.

**UNIT - II**

Performance ofRC buildings, behaviorofRCbuildings in pastearthquakes,influenceofunsymmetry, infillwalls,foundations, softstory, confinementofconcrete, and ductility.

**UNIT - III**

CapacityDesign ofRCMembers, Design forStrong column & weakbeam, Design ofBeam-ColumnJoints.

**UNIT – IV**

Specialaspects inMulti-storybuildings, Effectoftorsion, flexible firststory, P-deltaeffect, soilstructureinteraction onbuildingresponse, driftlimitation.

**UNIT -V**

Shearwall with ductile detailing. Preliminary sizing and Modeling of RC Buildings, Ductility and factors affecting ductility of RC members.

#### **UNIT – VI**

Seismic design of floor diaphragm. Design for Fire Resistant, Creep, Shrinkage and Thermal stresses.

#### **TEXTBOOKS:**

1. Agrawal P. & Shrikhande M., Earthquake Resistant Design of Structures, Prentice Hall India, New Delhi, 4th Edition, 2007.
2. Bruneau, M.; Uang, C.M.; & Whittaker, A Ductile Design of Steel Structures McGraw Hill.
3. Mazzolani, F.M.; & Piluso Theory and Design of Seismic Resistant Steel Frames E & FN Spon

#### **Reference Books:**

1. Paulay, T. & Prestley, M.J.N., Seismic design of RC & Masonry Buildings, John Wiley & Sons; 2<sup>nd</sup> Edition, 1999
2. Farzad Naeim, Handbook on Seismic Analysis and Design of Structures, Kluwer Academic Publisher, 2001
3. Booth, E., Concrete Structures in Earthquake Regions, Longman Higher Education, 1994

## **PSES32 IDCS (a):QUALITYAND SAFETYIN CONSTRUCTION**

**Teaching scheme: 03 L+01 T=04**

**Credit:04**

**Evaluationscheme: 20IE+10 MSE+70 ESE**

**Total marks: 100**

**DurationofESE: 3 Hrs.**

### **Objective:**

Bystudyingthis subjectstudentsshallbe awareofsafetyand precautionsissuesduringquality construction

### **Unit:I**

Totalqualitymanagementconcepts;ISO9000;QA/QCsystems and organizations, NationalbuildingCode2005.

### **Unit:II**

QualityAudits;Problemsolvingtechniques;Statistical QualityControl;QualityFunctionDeployment.

### **Unit:III**

Material QualityAssurance;SpecificationsandTolerances.

### **Unit:IV**

Safetyissues;Injuryaccidents and theircauses;Safetyprogramcomponents;Roleofworkers,Supervisors,Managers andOwners.

### **Unit:V**

SafetyProcedures forvarious constructionoperations;Safetyaudits;Safetylaws.

### **Unit:VI**

SafetyOrganizationand Management:Safetypolicies,safetyorganization,safetycommittees,safetyrepresentatives,outside agencies– Govt. intervention,internationalagreements.



**REFERENCES:**

1. Levitt, R.E. and Samelson, N.M., Construction Safety Management, McGraw-Hill Book Company, Inc., N.Y. 1991.
2. Juran Frank, J.M. and Gryna, F.M., Quality Planning and Analysis Tata McGraw Hill 1982.
3. Raymond Elliot Levitt & Nancy Morse Samelson Construction Safety Management Amazon Second edition
4. Grant E.L. and Levensworth Statistical Quality Control McGraw Hill 1984.
5. Hutchins G, ISO 9000, Visa Books, New Delhi, 1993.
6. Ron Baden Hellard, Total Quality in Construction Projects, Thomas Telford, London

**PSES33: COMPUTER AIDED ANALYSIS LAB****Teaching scheme: 04P = 04****Credit: 02****Evaluation scheme: 50TW + 50P/OE****Total marks: 100****PRACTICALS (Minimum five practicals to be performed):**

1. Analysis and Design of Multistoried Building.
2. Analysis and Design of RCC Water Tanks.
3. Analysis and Design of RCC Bridge.
4. Analysis and Design of Industrial Building.
5. Analysis and Design of Bunkers and Silos.
6. Analysis and Design of Storage Vessels.