DAV UNIVERSITY, JALANDHAR

Course outcomes of M.Tech in Structural Engineering

SEMESTER 1

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**MGT551**
Course Title	**Research Methodology**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Understand research problem formulation. CO2: Student will able to analyze research related information CO3: Student will able to follow research ethics

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES541**
Course Title	**Advanced Structural Analysis**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Solve the skeletal structures using the direct stiffness method CO2: Student will able to solve the skeletal structures using flexibility method CO3: Student will able to develop the computer programs using the direct stiffness method and Use the commercial software for the analysis

In hours			
L	T	P	Credit
4	0	0	4

Course Code	**CES501**
Course Title	**Dynamics of Structure**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to apply fundamental theory of structural dynamics and equation of motion CO2: Student will able to analyze and study dynamics response of single and multi-degree-of freedom systems. CO3: Student will able to use the available software for dynamic analysis.

In hours			
L	T	P	Credit
4	0	0	4

Course Code	**CES503**
Course Title	**Analysis and Design of Foundation**
Course Outcomes	**On the completion of the course the student will be able to** CO1: To determine the bearing capacity of soil and the probable settlement and also to select the type of depth of foundation for a project. CO2: To import empirical knowledge of soil behavior required by the geotechnical engineer for the design of foundation and other soil related structures. CO3: Student will know about design pile foundations for structures

In hours			
L	T	P	Credit
4	0	0	4

Course Code	**CES505**
Course Title	**Bridge Engineering**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to understand behaviour of Bridge components CO2: Student will able to understand the components of bridges CO3: Student will know the design of simple bridges

In hours			
L	T	P	Credit
0	0	4	2

Course Code	**CES507**
Course Title	**Structural Engineering Laboratory-I**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Handle appropriate equipments and tools CO2: Student will able to Design simple experiments related with structural systems CO3: Student will Function as team member for laboratory work

SEMESTER 2

In hours			
L	T	P	Credit
4	0	0	4

Course Code	**CES502**
Course Title	**Theory and Design of Plates and Shells**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to understand basic concepts of theory of plates and shells CO2: Student will able to solve problems related to thin plates and shells CO3: Student will apply the numerical techniques and tools for the complex problems

Departmental Specific Elective-I

In hours			
L	T	P	Credit
4	0	0	4

Course Code	**CES521**
Course Title	**Pre-stressed Concrete**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to understand the basic aspects of pre-stressed concrete fundamentals, including pre and post-tensioning processes CO2: Student will able to find out losses in the pre-stressed concrete CO3: Student will know about the **a**nalyze and design fully pre-stressed concrete flexural members, compression members. CO4: Student will able to design end blocks with pre-stressing anchorages

In hours			
L	T	P	Credit
4	0	0	4

Course Code	**CES523**
Course Title	**Finite Element Analysis**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Implement advanced concepts in Finite Element Analysis CO2: Student will able to Solve plate and shell problems CO3: Student will Solve non-linear structural engineering problems

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES525**
Course Title	**Tall Structures**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to identify about different systems and various loads in Tall structures CO2: Student will able to identify about various structural systems and their behavior CO3: Student will know about interpret static, dynamic and stability analysis of various systems CO4: Student will able to classify various Flooring systems and modern progress of tall structures

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES527**
Course Title	**Ground Improvement**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to demonstrate how theoretical knowledge and observation of engineering performance assist in rational application of ground modification procedure. CO2: Student will able to give a thorough understanding of the various techniques used in ground improvement. CO3: Student will know about the different materials in improving bearing capacity of soil..

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES529**
Course Title	**Soil Structure Interaction**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to elucidate soil structure interaction concept and complexities involved. CO2: evaluate soil structure interaction for different types of structures under various conditions of loading and subsoil characteristics. CO3: evaluate interaction analysis of pile and pile groups with rigid cap. CO4: evaluate action of group of piles under lateral loading considering stress-strain characteristics of real soils.

Departmental Specific Elective-II

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES522**
Course Title	**Advanced Structural Design and Detailing**
Course Outcomes	**On the completion of the course the student will be able to** CO1: design and carry out the reinforcement detailing for different components of Building CO2: design and detail RC retaining walls. CO3: Should be able to analyse the behaviour and drift capacities of various high rise structural forms.

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES524**
Course Title	**Advanced Solid Mechanics**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Understand basic concepts of Elasticity and Plasticity CO2: Student will able to Solve problems of elasticity and plasticity applied to isotropic materials CO3: Student will able to Introduce Fracture Mechanics and its applications

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES526**
Course Title	**Disaster Reduction and Management**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to impart awareness about the effect of earthquakes on structures. CO2: Student will able to study IS code provisions for the analysis, design and detailing of earthquake resistant Structures CO3: Student will be capable of design and detailing of earthquake resistant structures

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES528**
Course Title	**Design of steel and steel concrete composites**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will identify the behavior of composite beams and columns CO2: Student will able to design and analysis the steel structures like gantry girders framed connections, compression and tension members. CO3: Student will be able to design connections in composite structures

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES530**
Course Title	**Site Investigation**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to gain a practical understanding of the planning and design of site investigations CO2: Student will able to gain the spectrum of available investigation techniques. CO3: Student will be able to the laboratory test scheduling, and interpretation of results

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES530**
Course Title	**Site Investigation**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to gain a practical understanding of the planning and design of site investigations CO2: Student will able to gain the spectrum of available investigation techniques. CO3: Student will be able to the laboratory test scheduling, and interpretation of results

Departmental Specific Elective-III

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES531**
Course Title	**Design of Industrial Structures**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to analyze and design of basic reinforced concrete and Steel components. CO2: Student will able to identify design principles and IS code specifications. CO3: Student will be able to design industrial buildings.

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES533**
Course Title	**Earthquake Resistant Design of Masonry and RC Buildings**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Plan a good structural configuration for seismic resistance. CO2: Student will able to Calculate the earthquake design forces using appropriate methods as per IS 1893-2002(Part-I). CO3: Student will able to Design the structure using IS 13920 code provisions. CO4: Student will be capable of applying the concept of Ductility and Base isolation in designing earthquake resistant structures.

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**CES535**
Course Title	**Hydraulic Structures**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will learn about the components and effect of different hydraulics structures. CO2: Student will able to Understand and design the different elements of dam. CO3: Student will be able to design To study IS code provisions for the analysis, design and detailing of hydraulics structures

In hours			
L	**T**	**P**	**Credit**
4	0	0	4

Course Code	**Advanced Concrete Technology**
Course Title	**CES537**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Discuss the concrete ingredients and its influence at gaining strength. CO2: Student will able to Summarize the concepts of conventional concrete and its differences with other concretes like no fines, light weight etc. CO3: Student will be able to Describe the application and use of special concretes like fiber reinforced concrete, self-compacting and high performance concrete.

In hours				
L	T	P	Credit	
4	0	0	4	

Course Code		**CES539**
Course Title		**Building Services**
Course Outcomes		**On the completion of the course the student will be able to** CO1: Student will able to gain various methods of record keeping, preparation of checklists. CO2: Student will able for the identification of defects and selecting suitable repair techniques. CO3: Student will be able for the suitable repair and rehabilitation techniques

In hours			
L	T	P	Credit
0	0	4	2

Course Code	**CES510**
Course Title	**Structural Engineering Laboratory-II**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Deploy low end applications using low and high level languages on microcontroller platform CO2: Student will able to Implement simple sketches on the Arduino boards involving several peripherals CO3: Student will Identify, design and implement applications on the Arduino boards producing custom shields

In hours			
L	T	P	Credit
0	0	4	2

Course Code	**CES512**
Course Title	**Seminar**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Final his/her dissertation topic CO2: Student will able to gain skill of presentation

In hours			
L	T	P	Credit
4	0	0	4

SEMESTER 3

Departmental Specific Elective- IV

Course Code	**CES532**
Course Title	**Construction Techniques and Management**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to identify the structural systems for various combinations of gravity and horizontal loading considering their functional use and heights. CO2: Student will able to analyze the behavior and drift capacities of various high rise structural forms CO3: Student will Understand the drift capabilities of different structural forms

In hours			
L	T	P	Credit
4	0	0	4

Course Code	**CES534**
Course Title	**Reliability Analysis of Structure**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to identify the structural systems for various combinations of gravity and horizontal loading considering their functional use and heights. To analyze the behavior and drift capacities of various high-rise structural forms. CO2: Student will able to learn basic concepts related to reliability analysis of structures. CO3: Student will know the use of general concepts of statistics for probabilistic analysis.

In hours			
L	T	P	Credit
4	0	0	4

Course Code	**CES542**
Course Title	**Wind effect on Structures**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to study the effect of wind loads, pressure variance on low and high rising structure CO2: Student will able to study the design consideration for different civil engineering structure in relationship with aerodynamic modifications CO3: Student will Design of structures for wind resistance.

In hours			
L	T	P	Credit
4	0	0	4

Course Code	**CES544**
Course Title	**Infrastructure Planning and Management**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will develop basic skills to serve various planning, development and management agencies in different professional capacities in the public sector as well as in private consultancy organizations later in their careers. CO2: Student will equipped with knowledge of basic theories, techniques, and design concepts to assume their assigned professional roles as members of multi-disciplinary teams which involve survey, analysis and plan making for an urban/regional areas

In hours			
L	T	P	Credit
4	0	0	4

Course Code	**CES546**
Course Title	**Rehabilitation of Structures**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to identify the causes for deterioration of structures and remedies through damage assessment. CO2: Student will able to learn various methods of diagnosis for the damage by Semi destructive and non-destructive tests CO3: Student will know about identify various retrofitting techniques and repair procedures

In hours			
L	T	P	Credit
0	0	12	16

Course Code	**CES13**
Course Title	**Dissertation Part - I**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Identify structural engineering problems reviewing available literature. CO2: Identify appropriate techniques to analyze complex structural systems. CO3: Demonstrate application of engineering and management principles through efficient handling of project

SEMESTER 4

In hours			
L	**T**	**P**	**Credit**
0	0	0	12

Course Code	**CES114**
Course Title	**Dissertation Part - II**
Course Outcomes	**On the completion of the course the student will be able to** CO1: Student will able to Apply appropriate techniques and tools to solve complex structural problems. CO2: Exhibit good communication skill to the engineering community and society. Students will be able to demonstrate professional ethics and work culture. CO3: Contribute in efficient technology transfer to the society.