



# NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

## DEPARTMENT OF CIVIL ENGINEERING

| COURSE PLAN – PART I  |  |                          |                   |
|---|--|--------------------------|-------------------|
| Name of the programme and specialization  | M.Tech. Geotechnical Engineering   |                          |                   |
| Course Title  | GEOTECHNICAL DESIGN STUDIO   |                          |                   |
| Course Code   | CE 810   | No. of Credits           | 2                 |
| Course Code of Pre-requisite subject(s)   | NIL  |                          |                   |
| Session   | II-Sem/Jan/2021  | Section (if, applicable) | -                 |
| Name of Faculty   | Dr. Deendayal  | Department               | Civil Engineering |
| Official Email  | deendayal@nitt.edu   | Telephone No.            | 0431-2053170      |
| Name of Course Coordinator(s)   | -  |                          |                   |
| Official E-mail   | deendayal@nitt.edu   | Telephone No.            |                   |
| Course Type (please tick appropriately)   | <input type="checkbox"/> Core course <input checked="" type="checkbox"/> Elective course |                          |                   |
| <b>Syllabus (approved in BoS)</b>   |  |                          |                   |
| Engineering aspect of finite element method -Basic tools of the design software –Different soil models –modelling of substructure and loading conditions –analysis of the response of the foundation under different loading conditions |  |                          |                   |
| <b>COURSE OBJECTIVES</b>  |  |                          |                   |
| 1. To understand the concept of software based numerical modelling.<br>2. To learn and carry out basic numerical modelling on PLAXIS 2D, 3D, FLAC3D v7.0 and OASYS Geotechnical software.   |  |                          |                   |
| <b>MAPPING OF COs with POs</b>  |  |                          |                   |
| <b>Course Outcomes</b>  | <b>Programme Outcomes (PO)<br/>(Enter Numbers only)</b>                                  |                          |                   |
| 1. To understand the concept of software based numerical modelling  | 1,2,3,4,6  |                          |                   |
| 2. To carry out basic numerical modelling for practical Geotechnical issues on PLAXIS 2D, 3D, FLAC3D v7.0 and OASYS Geotechnical software   | 4,5,6  |                          |                   |

| COURSE PLAN – PART II  |  |
|--|--|
| <b>COURSE OVERVIEW</b>   |  |
| To understand the concept of software based numerical modelling. |  |



| <b>COURSE TEACHING AND LEARNING ACTIVITIES</b> |             |  |                         |
|--|-------------|--|-------------------------|
| <b>S.No.</b>                                   | <b>Week</b> | <b>Topic</b>   | <b>Mode of Delivery</b> |
| 1  | Week 1      | Engineering aspect of finite element method                                    | PPT & Virtual Mode      |
| 2  | Week 2      | Basic tools of the design software   | PPT & Virtual Mode      |
| 3  | Week 3      | Different soil models  | PPT & Virtual Mode      |
| 4  | Week 4      | modelling of substructure and loading conditions                               | PPT & Virtual Mode      |
| 5  | Week 5      | analysis of the response of the foundation under different loading conditions. | PPT & Virtual Mode      |
| 6  | Week 6      | PROBLEMS ON PILE FOUNDATIONS USING (PLAXIS 2D/3D)                              | PPT & Virtual Mode      |
| 7  | Week 7      | PROBLEMS ON PILE FOUNDATIONS CYCLIC LOADING (PLAXIS 3D)                        | PPT & Virtual Mode      |
| 8  | Week 8      | PROBLEMS ON EMBANKMENT- (PLAXIS 3D)  | PPT & Virtual Mode      |
| 9  | Week 9      | INTRODUCTION TO FLAC 3D  | PPT & Virtual Mode      |
| 10   | Week 10     | PROBLEMS ON EMBANKMENT USING (FLAC 3D)   | PPT & Virtual Mode      |
| 11   | Week 11     | <b>Mid-Semester Exam</b>   |                         |
| 12   | Week 12     | PROBLEMS ON EMBANKMENT USING (FLAC 3D)   | PPT & Virtual Mode      |



|    |         |  |                    |
|----|---------|--|--------------------|
| 13 | Week 13 | PROBLEMS ON SLOPES STABILITY USING (FLAC 3D)                     | PPT & Virtual Mode |
| 14 | Week 14 | PROBLEMS ON GEOTEXTILE USING (FLAC 3D)                           | PPT & Virtual Mode |
| 15 | Week 15 | INTRODUCTION TO OASYS GEOTECHNICAL SOFTWARE.                     | PPT & Virtual Mode |
| 16 | Week 16 | PROBLEMS ON EMBANKMENT/SLOPES USING OASYS GEOTECHNICAL SOFTWARE. | PPT & Virtual Mode |
| 17 | Week 17 | <b>Final Assessment</b>  |                    |

**COURSE ASSESSMENT METHODS**

| S.No. | Mode of Assessment                  | Week                  | Duration    | % Weightage      |
|-------|-------------------------------------|-----------------------|-------------|------------------|
| 1     | Continuous Assessment (Assignments) | Weekly                | 1 week time | 50 marks         |
| 2     | Mid-Semester Exam                   | 11 <sup>th</sup> Week | 1 hour      | 20 marks         |
| 3     | CPA-Compensation Assessment*        | 16 <sup>th</sup> week | 1 hour      | 20 marks         |
| 4     | Final Assessment *                  | 17 <sup>th</sup> week | 2 hour      | 30 marks         |
| 6     | <b>Total</b>                        |                       |             | <b>100 marks</b> |

\*mandatory; refer to guidelines on page 6

**ESSENTIAL READINGS : Textbooks, reference books and journals.**

**References:**

- 1.PLAXIS 2D & 3D manuals.
- 2.FLAC3D User guide.
- 3.OASYS Geotechnical software user manual.

**COURSE EXIT SURVEY**



1. Class committee meetings.
2. Online - Feedback forms submission through MIS.

**COURSE POLICY** (including compensation assessment to be specified)

- Minimum 75% attendance is compulsory for attending the final examination.

**ATTENDANCE POLICY** (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

**ACADEMIC DISHONESTY & PLAGIARISM**

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

**ADDITIONAL INFORMATION, IF ANY**

The Course Coordinator's Room No. : 101 (Civil- Annex Building)  
Timings : 10 a.m. to 5 p.m.  
Email ID : deendayal@nitt.edu  
Telephone No. : 0431-250-3170

**FOR APPROVAL**

  
Course Faculty \_\_\_\_\_

  
CC- Chairperson \_\_\_\_\_

  
Head  
Department of Civil Engineering  
National Institute of Technology  
Tiruchirappalli - 620 015.

HOD



**Guidelines**

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- d) The passing minimum shall be as per the regulations.

| B.Tech. Admitted in                            |      |  |      | P.G. |
|--|------|--|------|------|
| 2018   | 2017 | 2016   | 2015 |      |
| 35% or (Class average/2) whichever is greater. |      | (Peak/3) or (Class Average/2) whichever is lower |      | 40%  |

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.