NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF CIVIL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	**M. Tech, Structural Engineering**		
Course Title	**Hydraulic Structures**		
Course Code	**CE682**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)			
Session	**July 2022**	**Section (if, applicable)**	**NA**
Name of Faculty	**Dr. Aneesh Mathew**	**Department**	**Civil Engineering**
Official Email	**aneesh@nitt.edu**	**Telephone No.**	**8502932688**
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		**Telephone No.**	
Course Type (please tick appropriately)	☐ **Core course**	✓ **Elective course**	

Syllabus (approved in BoS)

Investigation and Planning - Preliminary investigations and preparation of reports, Layout of projects, Geological and hydrological investigations.

Analysis and Design of Dams - Earthen Dam and Gravity Dam.

Analysis and Design of Arch Dam, Infiltration Gallery, Collector wells.

Construction of Dams - Masonry, Concrete and Earthen Dams, Foundation for Dams– Principles of Foundation treatment, grouting methods.

Design of Weirs on Permeable foundation - Creep theory, Potential theory, Flow nets, design of weirs - Khosla's theory.

Reference Books

1. Creager, W. P. Justin D, and Hinds, J., Engineering for Dams Vol. I, II and III.
2. Kushalani, K. B., Irrigation (Practice and Design) Vol. III and IV.
3. P. Novak , A. I. B. Moffat , C. Nalluri , R. Narayanan , Hydraulic Structures, CRC Press, 4th Edition, 2007.
4. Ken Weaver and Donald Bruce, Dam Foundation Grouting, American Society of Civil Engineers, Rev Exp Edition, 2007.
5. Santhosh Kumar Garg, Irrigation Engineering and Hydraulic Structures, Khanna Publishers, 1997.

COURSE OBJECTIVES
1. To understand preliminary investigations for hydraulic structures. 2. To understand geological and hydrological investigations for hydraulic structures. 3. To get exposed to analysis and design of dams. 4. To familiarize students with construction of dams and foundation for dams. 5. To learn design of weirs on permeable foundation.

MAPPING OF COs with POs	
Course Outcomes	**Programme Outcomes (PO)** (Enter Numbers only)
1. To carry out investigation and planning of hydraulic structures.	**1,2,4,5,6,7,9,10,11**
2. To analyse and design different types of dams.	**1, 2,3,4,12**
3. To understand construction of different types of dams.	**1,2,3,5,9,11**
4. To be familiar with foundation treatment for dams.	**1,2,5,6,11**
5. To design weirs on permeable foundation.	**1,2,3, 4,12**

COURSE PLAN – PART II

COURSE OVERVIEW

This course primarily focuses on analysis, design and construction of various hydraulic structures. Preliminary geological and hydrological investigations, Analysis and Design of Dams, Construction of Dams, and Design of Weirs on Permeable foundation will be explained in the course in detail.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week1	Investigation and Planning - Preliminary investigations and preparation of reports, Lay out of projects, Geological and hydrological investigations- Case studies	PPT/ Digital Writing Pad /Black Board
2	Week 2		
3	Week 3	Analysis and Design of Dams: Design of gravity dam -Forces acting on gravity dam, Modes of failure and structural stability, Design	PPT/ Digital Writing Pad /Black Board
4	Week 4	Analysis and Design of Dams: Design of Earthen dam-causes of	

5	Week 5	failures of Earthen dams, Design Criteria, Seepage Analysis, Stability	PPT/ Digital Writing Pad /Black Board
6	Week 6	Analysis and Design of Arch Dam	PPT/ Digital Writing Pad /Black Board
7	Week 7		PPT/ Digital Writing Pad /Black Board
8	Week 8	Infiltration Gallery, Collector wells	
9	Week 9	Construction of Dams - Masonry, Concrete and Earthen Dams, Foundation for Dams	PPT/ Digital Writing Pad /Black Board
10	Week 10		PPT/ Digital Writing Pad /Black Board
11	Week 11	Principles of Foundation treatment, grouting methods	
12	Week 12	Design of Weirs on Permeable foundation - Creep theory for seepage flow, Potential theory	PPT/ Digital Writing Pad /Black Board
13	Week 13		PPT/ Digital Writing Pad /Black Board
14	Week 14	Concept of Flow nets, hydraulic design of weirs - Khosla's theory	PPT/ Digital Writing Pad /Black Board
15	Week 15 &Week 16		PPT/ Digital Writing Pad /Black Board

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

Sl.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment 1	Week 6	1 Hour	20

2	Assessment 2	Week 12	1 Hour	20
3	Assignments, Quizes and Seminars	As per deadlines	Assignments are to be submitted with	20
			in 1-week duration	
CPA	Compensation Assessment*	Week 16	1 Hour	20
4	Final Assessment *	Week 17/18	2 Hour	40

***mandatory; refer to guidelines on page 6**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

It is proposed to take feedback from the students, at the end of the semester to evaluate the execution of the course.

COURSE POLICY (including compensation assessment to be specified)

Mode of Correspondence:

Mode of correspondence would be through phone/ E-mail to the class representative and vice versa.

Compensation Assessment Policy:

Retest will conduct to those students who have missed Cycle Test on genuine grounds. The portions of the retest will include the portions covered till the date.

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

For any queries or doubt clarification, students are free to contact through E-mail **aneesh@nitt.edu or Via Phone.**

FOR APPROVAL

Aneesh 14/9/22

Dr. Aneesh Mathew
Course Faculty

Dr. Deendayal Rathod
CC- Chairperson

Dr. G. Swaminathan
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.