# GUJARAT TECHNOLOGICAL UNIVERSITY

**CIVIL (WATER RESOURCES ENGINEERING) (33)**
FLOOD MANAGEMENT
**SUBJECT CODE:** 2743301
**M.E. 4TH SEMESTER**

**Type of course:** Water resources and channel hydraulics

**Prerequisite:** Hydrology and channel hydraulics

**Rationale:** Students will be able to understand flood assessment and management suing various Geo-spatial techniques and mathematical modeling. They will also be able to understand flood warning system and flood forecasting methods.

**Teaching and Examination Scheme:**

| Teaching Scheme | | | Credits | Examination Marks | | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Theory Marks | | Practical Marks | | | | |
| L | T | P | C | ESE (E) | PA (M) | ESE (V) | | PA (I) | | |
| | | | | | | ESE | OEP | PA | RP | |
| 3 | 2# | 0 | 4 | 70 | 30 | 30 | 0 | 10 | 10 | 150 |

**Content:**

| Sr. No. | Content | Total Hrs | % Weightage |
|---|---|---|---|
| 1 | Criteria for sustainable water management, integrated catchment management. | **4** | **10** |
| 2 | Flows in catchments, water resources and floods and its causes, damages caused by flood | **4** | **10** |
| 3 | Principles of flood management, strategies of intervention, comparing the options, stakeholder's involvement and project appraisal, structural and non-structural measures. | **6** | **10** |
| 4 | Flood assessment using Geo-spatial techniques and mathematical modelling | **4** | **10** |
| 5 | Flood routing in channels and reservoirs. Flood routing using numerical methods, HEC-RAS applications. | **8** | **20** |
| 6 | Reservoir operations, Real-time flood warning system and flood forecasting. | **4** | **10** |
| 7 | Flood management as changing risks, frequency approaches vs. time series, risk vs. uncertainty, flood and ecosystem. | **8** | **20** |
| 8 | Vulnerability to floods, impact of floods, assessing the risk, flood damage analysis and flood control measures. | **4** | **10** |

**Reference Books:**


1 Ashley R., Garvin S., Pasche E. and Vassilopoulos A., Advances in Urban Flood Management, Balkema, 2007
2 Saul A, Floods and Flood Management, Springer, 1992.

3 Schanze J., Zeman E., and Marsalek J., Flood Risk Management, NATO Science Series IV: Earth and Environmental Science, 2006.
4 Applied hydrology by V.T chow, David R maidment, and Larry W mays Engineering hydrology by Raghunath
5 Engineering hydrology by K. Subramanya

**Course Outcome:**
After learning the course the students should be able:

Students will be able to perform hydraulic design of structures for flood control. They will also be able to understand clearly flood routing and its effect in flood management and control

**List of Tutorials:**

1. Study of catchments area features planning
2. Estimation of flood
3. Flood warning system
4. Flood routing and flood management
5. Flood impact assessment
6. Flood damage analysis
7. Flood control measures

**List of Open Source Software/learning website:**

https://en.wikipedia.org/wiki/Flood_control
www.water.ca.gov/floodmgmt/
HEC-RAS

**Review Presentation (RP):** The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.