GUJARAT TECHNOLOGICAL UNIVERSITY

CIVIL (GEOTECHNICAL ENGINEERING) (43)

SOFTWARE APPLICATIONS IN GEOTECHNICAL ENGINEERING

SUBJECT CODE: 2724310

SEMESTER: II

Type of course: Major Elective II

Prerequisite: Knowledge of MS office and programming of small problems in any computer language

Rationale: In field of civil engineering now adays, application of related software and its knowledge with its use to analyse and design of civil engineering structures is must.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks		Practical Marks				
				ESE (E)	PA (M)	ESE (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2#	2	5	70	30	20	10	10	10	150

Content:

Sr. No.	Topics	Total hours	% Weightage
1	Programming : in excel for geotechnical test result calculation and preparation of graphs etc. Analysis , design and other geotechnical engineering applications using Visual Basic. Concept of expert system, Genetic algorithms, Artificial Intelligence. Artificial Neural Network and their scope in geotechnical engineering.	18	40
2	Software Usage : Application using STAADfoundation-Generation of geometry in STAADPro-import file-Input data-Design of isolated foundation-Design of raft foundation. Application using GEO5-input data in various modules-understanding of generated output.	24	60

Reference Books:

1 Mastering excel 2010 by Bill Jelen

2 Excel 2010 – Made simple by Katz A

3 Visual Basic Programming by Dr.A.Murugan & Dr.K.Shyamala

4 Beginning Visual Basic 2012 by Bryan newsomw

5 Artificial Intelligence by Saroj Kaushik

6 Introduction to artificial neural network by Paulraj Shivanandam

Course Outcome:

After learning the course the students should be able to:

1. Know the basic equations to find out index properties and apply that relation in programming.

2. Apply the basic fundamental of analysis design in programming.

3. Know how to input data in various modules of software.

4. Know how to interpret output of different software

List of Experiments/Tutorials:
Problems from above topics.

Open Ended Problems:

- Prepare programs in excel for various test conducted in GE-I & GE-II at UG level.
- Prepare Programs in Visual Basic for the various topic covered at UG level and PG level.
- Create geometry in STAAD and import them in to STAAD foundation and preparation of various combination of input data for STAADfoundation.
- Prepare input data for various GEO5 modules.

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