ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ
"ವಿಟಿಯು ಅಧಿನಿಯಮ ೧೯೯೪"ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ
"ಜ್ಞಾನ ಸಂಗಮ", ಬೆಳಗಾವಿ-೫೯೦೦೧೮, ಕರ್ನಾಟಕ, ಭಾರತ

Visvesvaraya Technological University
(State University of Government of Karnataka Established as per the VTU Act, 1994)
"Jnana Sangama" Belagavi-590018, Karnataka, India
Phone: (0831) 2498100, Fax: (0831) 2405467, Website: vtu.ac.in

Dr. A. S. Deshpande B.E., M.Tech., Ph.D.
Registrar

Phone: (0831) 2498100
Fax: (0831) 2405467

Ref: VTU/BGM/BOS/A9/2020-21 / 556

Date: 11 MAY 2021

CIRCULAR

Subject: Updated syllabus of 18ENG65 Building Structure-VI Regarding...

Reference:

1. BoS in Architecture meeting proceeding dated 28.04.2021
2. Hon'ble VC sir's approval dated 11.05.2021

Concerning the subject cited above, the syllabus of **18ENG65 Building Structure –VI** of the B.Arch., program is updated by including the Earth Quick Resistant Structures portion and the syllabus copy is enclosed with this circular for reference. Also, updated syllabus copies of the Architecture program 2018 scheme are uploaded on the VTU web portal for use of stakeholders @ https://vtu.ac.in/en/b-e-scheme-syllabus/#menu0.

All the Principals/ Directors of School of Architecture Colleges coming under the ambit of University are hereby requested to inform the faculty and student of the Architecture department.

Encl: Updated syllabus copy of 18ENG65.

Sd/-
REGISTRAR

To,

- All the Principals/Directors of the School of Architecture Colleges under the ambit of VTU Belagavi.

Copy to:

1. The Registrar(Evaluation) for information and needful
2. The Registrar's Office, VTU, Belagavi, for information.
3. The Special Officer, Academic Section, VTU Belagavi, for information.
4. The Special Officer CNC section to upload the circular on the VTU web portal.

REGISTRAR

18ENG65 – BUILDING STRUCTURES - VI

CONTACT PERIODS : 3 (1 Lecture + 2 Pract./Tuto./Semi.) per week

PROGRESSIVE MARKS : 75

VIVA MARKS: 75

OBJECTIVE: *Integration of structures with architectural objectives by developing an understanding of building structures and selection criteria for appropriate vertical systems; conceptual design of structures for gravity and lateral wind and seismic loads.*

OUTLINE

1 **Introduction of High Rise Structures and case study.**

2. **Introduction to the Structural design Project**: Design for a 10 story building of dimension 30m X 30m [Suggested Dimension], 35 meter height, 10m X 10m column grid and with service core in the central bay. Calculation of building loads load calculation based on the IS 875 and seismic loads and wind loads and design of gravity and lateral systems.

3. **Seismic loading**: Seismic loading calculation based on IS 1893 Code; Static Analysis Procedure .

4. **Lateral load resisting systems-Moment resisting frame design:** Design of Moment-resisting 2-dimensional frame assemblies of beams and columns, with the beams rigidly connected to the columns. General moment resisting framing arrangement and sizing and design of beams, columns and slabs for 30m X 30m [Suggested Dimension], 35 meter high building, and basic load path and total structural weight calculation.

5. **Shear Wall System:** Design of Shear walls as lateral load resistance structural systems. Application of lateral loads along the height, transference to the wall by diaphragm slabs in concrete or masonry. General Shear wall framing arrangement and sizing and design of beams, columns/ shear wall and slabs for 30m X 30m [Suggested Dimension], 35 meter high building, and basic load path and total structural weight calculation.

6. **Braced frame**: Design of lateral structural system to resist lateral loads (wind and seismic). Braced frames as vertical trusses with members designed to resist in tension and compression due to triangulation in steel or RCC. General Braced frame arrangement for 30m X 30m [Suggested Dimension], 35 meter high building, and basic load path and total structural weight calculation.

7. **Introduction to underground structures:** RCC retaining walls and water tanks, calculation of forces on vertical walls.

8. **Understanding earthquake and seismology:** Earthquake origin and propagation, earthquake occurance, plate tectonics, faults, causes and classifications of earthquake, seismic waves. Magnitude and intensity of earthquake. Basic terminologies- Focus,

epicenter. Seismological instruments. Earthquake zones of India.

9. **Earthquake effects on building and Earthquake resistant design strategies:** Response of buildings to earthquakes, building forms and seismic effects related to buildings configuration. Material, plan and vertical irregularities. Mass and stiffness distribution, soft story etc. Concept of seismic design, strength, stiffness, period, ductility, damping, centre of mass, centre of rigidity, torsion etc.

10. **Ductile detailing of RC and steel structures:** Considering IS1893-2002 IS: 13920-1993, IS456 and IS800-2007.

11. **Recent techniques:** Introduction to dampers, base isolation and other energy absorbing systems used in earthquake resistant design.

Note:

1) Minimum one plate on each loading calculation and vertical structural systems.

2) This course should desirably be conducted involving consulting engineers and architects.

REFERENCE:

1. Martin Bechthold, Daniel L Schodek, "*Structures*"; 2014, PHI Learning Private limited.
2. Francis D.K. Ching, "*Building Structures Illustrated*", 2nd Edition; 2013, John Wiley & Sons.
3. Francis D.K. Ching, "*Building Construction Illustrated*", 4th Edition; John Wiley & Sons
4. Indian Standard Codes - IS456-2000, IS-875 (Part I to IV), IS-1893; National Building Codes, SP-34 Steel detailing.