



COURSE: IRRIGATION SYSTEM DESIGN
(Thiết kế hệ thống thủy lợi)
Course code: CIVE4238

1. **Number of Credit:** 3 (3-0-0)

2. **Number of Hours:** Total: 45;

Theory: 45; Practice.... ; Experiment ; Project: ; Major exercise:; Field trip: ;

3. **Education program:**

- *Compulsory course for:*

- *Selective course for: Civil Engineering*

4. **Assessment:**

Evaluation	Number	Description	Time	Weight
Assignment	3	Assignment 1	Lecture 4	10%
		Assignment 2	Lecture 7	10%
		Assignment 3	Lecture 10	10%
Midterm exam	1	Midterm exam	Lecture 8	20%
Final exam	1	3 – 5 practice questions in 75 - 90 minutes (Open notes, open books)	1 -2 weeks after finishing the course	50%

5. **Course mandatory**

- *Prerequisites(s):* Soil and Water Engineering (CIVE4189)

- *Advisory:* Hydraulic engineering (CIVE4107)

- *Corequisites:*

6. **Course summary**

- **Vietnamese:** Cung cấp cho người học nguyên lý cơ bản và quy trình cần thiết trong lựa chọn, thiết kế và vận hành hệ thống tưới áp lực và hệ thống tưới mặt (tưới tự chảy).

- **English:** To provide an understanding of basic engineering principles and procedures which are necessary for the successful selection, design and operation of pressurized and surface (free flow) irrigation systems.

7. Instruction(s) information

No.	Instructors' name	Academic Title	Cellphone	Email	Position
1	Nguyen Quang Phi	Dr.	0913050625	quangphi_nguyen@tlu.edu.vn	Main lecture, Head of division
2	Ngo Van Quan	Assoc. Dr.	0918248388	ngovanquan@tlu.edu.vn	Senior lecture, Vice head of division
3	Tran Quoc Lap	Dr.	0966916677	tranquoclap@tlu.edu.vn	Lecture
4	Lê Thi Thanh Thuy	Dr.	0917488099	lethanhthuy@tlu.edu.vn	Lecture
5	Tran Tuan Thach	Dr.	0988838618	thachtt@tlu.edu.vn	Lecture

8. References

[1] Hoffman, G.J., R.G. Evans, M.E. Jensen, D.L. Martin, and R.L. Elliott. (2007). Design and Operation of Farm Irrigation Systems. 2nd Ed., ASABE, St. Joseph, MI, 1040 pp. ISBN: 1-892769-64-6.

[2] TCVN-9170-2012 – Irrigation and drainage systems – Requirement for sprinkler irrigation method. (#000015283)

9. Course content:

No.	Content	Teaching and learning activities	Number of hours		
			T	P	E/F
	Chapter 1: Introduction	<u>Lecturer:</u>	3		
	1.1. Overview	- Introduce CV			
	1.2. Worldwide irrigation development	- Introduce course syllabus, course contents, assessment requirements and course evaluations			
	1.3. Irrigation development in the United States	- Introduce skills to gain good results	3		
	1.4. Issues facing irrigated agriculture	<u>Lecturer:</u>			
	1.5. Future directions	- Deliver lecture using projector and board			
	Chapter 2. Soil and water relationships	- Visual illustration using images, video clips			
	2.1. Introduction	- Quarry	3		
	2.2. Water holding characteristic of soils				
	2.3. Soil hydraulic conductivity				
	2.4. Water movement in soil				
	Chapter 3. Irrigation water requirements				

3.1. Introduction 3.2. Definition 3.3. Soil water balance-based irrigation schedule 3.4. Estimation of evapotranspiration Chapter 4. Efficiency and uniformity 4.1. Introduction 4.2. Irrigation scheme physical model 4.3. Irrigation performance parameter definition Assignment 1. Chapter 5. Hydraulics of sprinkler and micro-irrigation system 5.1. Introduction 5.2. Hydraulic of pipe system 5.3. Irrigation system valves 5.4. Water distribution to the soil 5.5. Redistribution to the soil Chapter 6. Design and operation of sprinkler systems 6.1. Introduction 6.2. Components of sprinkler systems 6.3. Design fundamentals 6.4. Application uniformity Assignment 2 Midterm exam 6.5. Solid set systems 6.6. Periodically moved laterals 6.7. Center Pivots 6.8. Lateral move systems 6.9. Low energy precision application systems Assignment 3 Chapter 7. Micro irrigation systems 7.1. Introduction 7.2. Micro irrigation systems 7.3. Design factors 7.4. Hydraulics of Emitter Design variation 7.5. Micro irrigation design Chapter 8. Design of surface systems 8.1. Introduction 8.2. Design consideration and approaches	<u>Students:</u> -Answer questions -Implement practice sheets -Submit homework and assignment	3		
		6		
		12		
		3		
		6		

8.3. Sloping -furrow irrigation 8.4. Border-strip irrigation 8.5. Level-basin and level furrow irrigation Chapter 9. Drainage systems 9.1. Introduction 9.2. Environmental considerations 9.3. Drainage system requirements 9.4. Approaches to design of subsurface drainage systems 9.5. Determining design variables Summary and reviews		3		
		3		

10. Expected Learning Outcomes (ELO) of the course:

No.	Expected Learning Outcomes of the course	PLO
1	Knowledge: + Understand knowledge in planning, design hydraulic structures in general and in water resources engineering in particular.	
2	Skills: + An ability in summarizing, analyzing, and handling data relating to water resources engineering; + An ability in designing modern irrigation system	
3	Self-governing and responsibilities (if existed):	
4	Graduate attributes, social responsibility (if existed): Have self- responsibility; develop the ability and responsibility in self-study	

11. Contact information

A. Division: Room 311 – A1 Building, Thuyloi University

B. Head of division:

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Hanoi, **day month year** 20

DEAN OF FACULTY
(Program management)

DEAN OF FACULTY
(Course management)

**HEAD OF
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Nguyen Quang Phi

