THUYLOI UNIVERSITY FACULTY OF WATER RESOURCES ENGINEERING DIVISION OF WATER RESOURCES ENGINEERING

COURSE SYLLABUS

Level of training: Undergraduate

COURSE: IRIGATION 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 exerccise:; Field trip:;

3. Education program:

- Compulsory course for:

- Selective course for: Civil Engineering

4. Assessment:

Evaluation	Number	Description	Time	Weight
Assignment	3	Assignment 1 Assignment 2 Assignment 3	Lecture 4 Lecture 7 Lecture 10	10% 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

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

3.1. Introduction	Students:		
3.2. Definition	-Answer questions		
3.3. Soil water balance-based	-Implement practice		
irrigation schedule	sheets		
3.4. Estimation of evapotranspirati	on -Submit homework and		
Chapter 4. Efficiency and uniform	ity assignment	3	
4.1. Introduction			
4.2. Irrigation scheme physical mo	odel		
4.3. Irrigation performance paramedefinition	eter		
Assignment 1.			
Chapter 5. Hydraulics of sprinkler micro-irrigation system	and		
5.1. Introduction		6	
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 o sprinkler systems	f	12	
6.1. Introduction			
6.2. Components of sprinkler syste	ems		
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 applicat systems	tion		
Assignment 3			
Chapter 7. Micro irrigation system	lS		
7.1. Introduction		3	
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 syste	ms	6	
8.1. Introduction			
8.2. Design consideration and approaches			

8.3	3. Sloping -furrow irrigation		
8.4	4. Border-strip irrigation		
1 1 1	5. Level-basin and level furrow rigation		
Cł	hapter 9. Drainage systems		
9.	1. Introduction	3	
9.2	2. Environmental considerations		
9.3	3. Drainage system requirements		
	4. Approaches to design of absurface drainage systems		
9.5	5. Determining design variables		
Su	ummary and reviews	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

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B. Head of division:

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Hanoi, day month year 20

DEAN OF FACULTY
(Program management)

DEAN OF FACULTY
(Course management)

DEVISION