

Course Title	Digital Control Systems	Course Code	ELEC733001	Credits	3-3-0
Department		Term and Year	20191	Course Categories	Major
Instructor	Kalyana Chakravarthy Veluvolu	Class Hours	Thu.1A1B2A Thu.2B3A3B	Classroom	IT 대학 1 호관(공대 10 호관)613 IT 대학 1 호관(공대 10 호관)613
Phone / E-mail	** 통합정보시스템 로그인- 수업/성적- 수업- 강의담당교수조회"에서 확인 가능함.			Classroom Language	English
Office & Office Hours	THU 4 - 6 pm				
Educational Objectives					

[Syllabus]

Course Outline					
The objective of this course is to learn discrete-time system modelling and analysis. Cascade compensation. State-space design methods. Optimal control. and design and implementation of digital controllers.					
Core Competencies					
Innovativeness		Reflection		Character	
Creativity <input type="checkbox"/>	Convergence <input type="checkbox"/>	Critical Thinking <input type="checkbox"/>	Exploration <input type="checkbox"/>	Communication <input type="checkbox"/>	Responsibility <input type="checkbox"/>
Course Objectives					
Competencies	Course Objectives			Representative Competence	

Critical Thinking	Develops reasoning for modeling and control design in discrete time domain						<input checked="" type="checkbox"/>
Prerequisites							
Automatic Control							
Recommended Subsequent Courses							
Special Topics on Control; Nonlinear Control;							
Grading Scale(100%)							
Attendance	Midterm Exam	Final Exam	Assignment	Presentation	Discussion	Others	
10%	25%	30%	35%	0%	0%	0%	
Evaluation Methods							
Assignments-35%							
Midterm + Final - 55%							
Attendance - 10%							
Textbook and Other References							

Digital Control Systems, 2e, Oxford University Press, 1992. ISBN: 0-19-512064-7

'Discrete-time Control Systems', K. Ogata, 2nd Edition, Pearson Education, 2002. ISBN: 81-7808-335-3

Notice to Students

This course requires good attendance for understanding. If you are absent for more than 2 lectures consequetively it will effect your performance. Solving of exercises is compulsory for understanding.

Support Available for Disabled Students

가. 청각장애 학생 : 앞자리 지정석, 강의자료 File 제공(가능한 과목에 한함), 긴급 전달사항은 메모 활용 등

나. 지체장애 학생 : 시험시간연장 등

다. 뇌병변장애 학생 : 시험시간연장, 강의자료 File 제공(가능한 과목에 한함) 등

라. 시각장애 학생 : 시험지 확대복사제공 등

마. 기타 장애정도에 따라 필요한 사안이 발생시 최대한 편의 제공함

[Course Content and Schedule]

no	Unit Goals and Learning Content	Teaching Methods	Assignments and Research Questions	비고
1	Discrete-time System Modeling and Analysis: Sampling Process. Z-transform. Inverse z-transform. Mapping between s and z domains. System stability.			
2	Discrete-time System Modeling and Analysis: Steady-state error analysis for stable systems. Root-locus analysis. Bilinear Transformation. Frequency Response			

3	Bilinear Transformation. Frequency Response Cascade Compensation: Digitization technique			
4	Direct Technique, Lead compensation Lag compensation,			
5	Frequency-response characteristics, Deadbeat response			
6	State Space Design Methods: State variable representations			
7	State-feedback using digitization			
8	Mid-term Exam			
9	State-feedback by pole placement, discrete controllability, state observers, discrete observability, dynamic output feedback			
10	State-feedback by pole placement, discrete controllability, state observers			
11	discrete observability, dynamic output feedback			
12	The discrete maximum(min) Principle;			
13	Optimal Control: Solution of the discrete Ricatti equation			
14	Optimal Control: Solution of the discrete Ricatti equation			
15	Quantization			

[Course Evaluation]

Categories	Questions	Note
Self-Rating	1.I participated actively in the course. 2.I have made a lot of effort while taking the course.	
Standard Questions	3.The course syllabus contained the detailed information about the operation of the course. 4.The professor ran the course according to the course syllabus. 5.The professor clearly stated the course plan in the first class. 6.The professor stated objectives of each lecture clearly and explicitly. 7.The professor stimulated my interest in the field. 8.The professor had expertise on the course contents. 9.The professor delivered the class contents adapting to student abilities and learning levels. 10.The professor used various teaching methods considering course contents. 11.The professor encouraged students to ask questions, and responded properly. 12.The professor gave assignments to deepen the course contents. 13.The professor provided meaningful and timely feedback on the students performances.	

	14. Overall, I would like to recommend this lecture to other students. 15. The course helped me to develop [the representative competency].	
Course Specific Questions	E-1. The course was taught in English. (5: over 80%, 4: over 60%, 3: 40-60%, 2: 20-40%, 1: under 20%) E-2. The course increased my English competency in the field.	
Optional Questions	I-1. The professor explained the course contents well. I-2. The professor gave a lecture in adjusting the intensity and tone of voice to deliver the course contents effectively.	

Cheating, plagiarism, and other dishonest practices will be punished as harshly as Kyungpook National University policies allow. The University specifies that cheating is grounds for dismissal. Penalties less severe may be imposed instead. A list of possible disciplinary actions is given below. Actions by the university:

- Failure in course
- Suspension from university for a designated period
- Expulsion from university