

Toyama College		Year	2022		Course Title	Instrumentation and Control
Course Information						
Course Code	0009		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	ECOfdesign Engineering Course		Student Grade	Adv. 1st		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials						
Instructor	Ishida Fumihiko					
Course Objectives						
Through this course, understanding of the following will be facilitated (1) signal types and the Fourier transform (2) continuous time systems (3) the sampling theory (4) the discrete-time Fourier transform (5) discrete time systems						
Rubric						
	Ideal Level of Achievement (Very Good)		Standard Level of Achievement (Good)		Unacceptable Level of Achievement (Fail)	
Evaluation 1	Clearly understands the type of signal and the Fourier transform and has the ability to calculate in detail		Understands the type of signal and the Fourier transform and has the ability to calculate in general		Unable to understand and calculate the type of signal and the Fourier transform in general	
Evaluation 2	Clearly understands the continuous time system and has the ability to calculate the input and the output of the system in detail		Understands the continuous time system and has the ability to calculate the input and the output of the system in general		Unable to calculate the input and the output of the continuous time system in general	
Evaluation 3	Clearly understands the sampling theory and has the ability to calculate the Nyquist frequency in detail		Understands the sampling theory and has the ability to calculate the Nyquist frequency in general		Unable to understand and calculate the sampling theory in general	
Evaluation 4	Clearly understands the discrete-time Fourier transform and has the ability to calculate in detail		Understands the discrete-time Fourier transform and has the ability to calculate in general		Unable to understand and calculate the discrete-time Fourier transform in general	
Evaluation 5	Clearly understands the discrete time system and has the ability to calculate the input and the output of the system in detail		Understands the discrete time system and has the ability to calculate the input and the output of the system in general		Unable to calculate the input and the output of the discrete time system in general	
Assigned Department Objectives						
学習・教育到達度目標 A-2 JABEE 1(2)(d)(1) JABEE 1(2)(d)(2) JABEE 2.1(1)						
Teaching Method						
Outline	In instrumentation and control of the system, various kinds of signal information processing is performed by digital signal processing using a computer. This course aims to understand the fundamentals of signal processing based on applied mathematics as the basis of instrumentation and control.					
Style	Lectures and exercises					
Notice						
Characteristics of Class / Division in Learning						
<input type="checkbox"/> Active Learning		<input checked="" type="checkbox"/> Aided by ICT		<input checked="" type="checkbox"/> Applicable to Remote Class		<input type="checkbox"/> Instructor Professionally Experienced
Course Plan						
			Theme		Goals	
1st Semester	1st Quarter	1st	The type and processing of the signal		Learn the type and processing of the signal	
		2nd	Periodic signal and Fourier series expansion		Learn periodic signal and Fourier series expansion	
		3rd	Aperiodic signal and the Fourier transform		Learn aperiodic signal and the Fourier transform	
		4th	Continuous time systems (1)		Learn continuous time systems	
		5th	Continuous time systems (2)		Exercise the calculation about the continuous time systems	
		6th	The Laplace transform		Learn the Laplace transform	
		7th	The sampling theory		Learn the sampling theory	
		8th	Exercise		Exercise the current ability	
	2nd Quarter	9th	Discrete-time signal and the discrete Fourier transform (1)		Learn the discrete-time signal and the discrete Fourier transform	
		10th	Discrete-time signal and the discrete Fourier transform (2)		Exercise the calculation about the discrete Fourier transform	
		11th	Discrete time systems		Learn discrete time systems	
		12th	The z transform		Learn the z transform	
		13th	Digital filters		Learn digital filters	
		14th	Exercise		Exercise the current ability	

		15th	Final examination				
		16th	Summary			Summarize the study content and confirm grades	
Evaluation Method and Weight (%)							
	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	30	0	0	0	0	100
Basic Ability	50	20	0	0	0	0	70
Technical Ability	20	10	0	0	0	0	30
Interdisciplinary Ability	0	0	0	0	0	0	0