

熊本高等専門学校		開講年度	令和04年度 (2022年度)	授業科目	デジタル信号処理工学
科目基礎情報					
科目番号	AE1207		科目区分	専門 / 選択	
授業形態	授業		単位の種別と単位数	学修単位: 2	
開設学科	電子情報システム工学専攻		対象学年	専2	
開設期	後期		週時間数	2	
教科書/教材	DISCRETE-TIME SIGNAL PROCESSING 3/e (Alan V. Oppenheim, Prentice Hall Signal Processing)				
担当教員	嶋田 泰幸				
到達目標					
The scope of work is as follows: ・ Theory to be covered: a) Basic digital filtering theory (FIR, IIR) and digital filter design. b) Basic adaptive filtering theory c) Up sampling, Down sampling ・ Hands-on section a) Design and Implementation of FIR and IIR digital filter b) Design and Implementation of Adaptive digital filter c) Design of UP/Down sampling filters					
ルーブリック					
	Ideal Level		Standard Level		Unacceptable Level
Achievement 1	Can design/implement an effective FIR/IIR filter.		Can design simple FIR/IIR filters.		Need to study how to design simple FIR/IIR filters
Achievement 2	Can design/implement an adaptive digital filter for noise cancellation.		Can design adaptive digital filters..		Need to study how to design adaptive digital filters
Achievement 3	Can design up sampling/down sampling systems		Can explain what up sampling/down sampling systems are.		Need to study how up sampling/down sampling systems work.
学科の到達目標項目との関係					
教育方法等					
概要	Digital Signal Processing (DSP) is very popular to model or represent the state or behaviour of a physical systems. The objective of this course is to provide a basic introduction to the theory of DSP.				
授業の進め方・方法	This course is conducted in English and all participants are allow to use English during classes. Participants will be requested to design digital filters as necessary, and they have to bring own PC to do simulation.				
注意点	Students are to do self-study for at least 30 hours per 1 credit.				
授業の属性・履修上の区分					
<input checked="" type="checkbox"/> アクティブラーニング		<input checked="" type="checkbox"/> ICT 利用		<input checked="" type="checkbox"/> 遠隔授業対応	
<input type="checkbox"/> 実務経験のある教員による授業					
授業計画					
		週	授業内容	週ごとの到達目標	
後期	3rdQ	1週	Fundamentals of Digital Signal Processing(1)	Students will be able to understand basics of Digital Signal Processing,ADC (Quantisation and sampling; Aliasing; Anti-aliasing)	
		2週	Fundamentals of Digital Signal Processing(2)	Same as above.	
		3週	Difference equations and Z transforms(1)	Students will be able to understand Z transform.	
		4週	Difference equations and Z transforms(2)	Same as above	
		5週	System model and its representation(1)	Students will be able to understand how to model systems in differential equation and Z transform.	
		6週	System model and its representation(2)	Same as above	
		7週	Fundamentals of Digital Filtering – FIR Filter	Students will be able to understand basic FIR filter and design simple FIR filters.	
		8週	Designing FIR Digital Filter	Students will be able to design FIR filters	
	4thQ	9週	Fundamentals of Digital Filtering – IIR Filter	Students will be able to understand basic FIR filter and design simple IIR filters.	
		10週	Designing IIR Digital Filter	Students will be able to design IIR filters	
		11週	Fundamentals of Adaptive Filtering(1)	Implement adaptive digital filter which cancels noise.	
		12週	Fundamentals of Adaptive Filtering(2)	Same as above	
		13週	Up sampling and Down sampling	Students will be able to understand upsampling and downsampling.	
		14週	Sub-band filtering	Students will be able to design filter banks.	
		15週	Summery and feedback		
		16週			
モデルコアカリキュラムの学習内容と到達目標					
分類	分野	学習内容	学習内容の到達目標	到達レベル	授業週
評価割合					
	Examination		Report	合計	
総合評価割合	0		100	100	
基礎的能力	0		0	0	

専門的能力	0	100	100
分野横断的能力	0	0	0