

東京工業高等専門学校		開講年度	平成29年度 (2017年度)		授業科目	応用数理学	
科目基礎情報							
科目番号	0019			科目区分	専門 / 選択		
授業形態	講義			単位の種別と単位数	履修単位: 2		
開設学科	物質工学専攻			対象学年	専1		
開設期	前期			週時間数	4		
教科書/教材	「数値解析入門」(山本哲朗、サイエンス社)、「数値計算の常識」(伊理正夫・藤野和建、共立出版)						
担当教員	市川 裕子						
到達目標							
Understand how to deal with mathematical problems using numerical methods from analytical viewpoint. Understand algorithms and procedures correctly and implement them on computers.							
ルーブリック							
	理想的な到達レベルの目安			標準的な到達レベルの目安		未到達レベルの目安	
Algorithms	Understand each algorithmn and the mathematical theory which is the base of it			Understand each algorithmn		Don't understand algorithms	
Implimentation	Impliment each algorithmn as a program and make sure the theory			Impliment each algorithmn as a program		Don't impliment algorithms	
English	Know words and expressions to discribe these theories			Know important expressions to discribe these theories		Don't know words and expressions to discribe these theories	
学科の到達目標項目との関係							
JABEE (c) 学習・教育目標 C1							
教育方法等							
概要	This course is designed to give an overview of the design, analysis and implementation of the several fundamental numerical method which are used to solve practical engineering problems.						
授業の進め方・方法	Applied Mathematics consists of 10 lectures, that emphasis the mathematics used to design numerical methods, and to analyse their properties. and 5 experiments with implementing algorithms in Computer Lab.						
注意点	Prerequisite: Calculus Multivariable Calculus, Linear Algebra, Ordinary Differential Equation, Programming						
授業計画							
		週	授業内容			週ごとの到達目標	
前期	1stQ	1週	Guidance and Introduction				
		2週	Error			Understand why errors are occurred in computer	
		3週	Linear Equations System and Matrices- Gaussian Elimination			Understand the algorithm	
		4週	Linear Equations System and Matrices- Iterative Method 1			Understand the algorithm	
		5週	Linear Equations System and Matrices - Iterative Method 2			Understand the algorithm	
		6週	Exercise in Computer Lab.			Impliment the algorithmn	
		7週	Non-linear Equations - Bisection Method, Secant Method			Understand the algorithm	
		8週	Non-linear Equations- Quadrature Mensuration by parts, Newton Method			Understand the algorithm	
	2ndQ	9週	Exercise in Computer Lab.			Impliment the algorithmn	
		10週	Numerical Integration -Trapezium Rule & Simpson's Rule			Understand the algorithm	
		11週	Numerical Integration - Monte Carlo Method			Understand the algorithm	
		12週	Exercise in Computer Lab.			Impliment the algorithmn	
		13週	Ordinary Differential Equation -Euler Method			Understand the algorithm	
		14週	Ordinary Differential Equation- Runge-Kutta Method			Understand the algorithm	
		15週	Exercise in Computer Lab.			Impliment the algorithmn	
		16週	Final Examination				
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							
	試験	発表	相互評価	態度	ポートフォリオ	その他	合計
総合評価割合	50	0	0	0	0	50	100
基礎的能力	50	0	0	0	0	50	100
専門的能力	0	0	0	0	0	0	0
分野横断的能力	0	0	0	0	0	0	0