AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Spectral Analysis and Chemometrics								
Course Code	MME625		Couse Level	Third Cycle (Doctorate Degree)					
ECTS Credit	9	Workload	225 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The learning of parametrical and nonparametrical methods used for spectral estimation problem and the supporting of techinal applications								
Course Content	Spectral estimation, Periodogram methods ,Corelogram methods								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration, Discussion								
Name of Lecturer(s)									

Prerequisites & Co-requisities	
Language Requisite	Yes

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading	
1	Modern Spectral Estimation: Theory and Application, Steven Kay, Prentice Hall, 1988.

Week	Weekly Detailed Course Contents	
1	Theoretical	The solution of a spectral estimation problem
2	Theoretical	Nonparametric techniques
3	Theoretical	Periodogram methods
4	Theoretical	Corelogram methods
5	Theoretical	Parametric methods
6	Theoretical	Auto Regressive (AR)
7	Theoretical	Moving Average (MA)
8	Intermediate Exam	Midterm
9	Theoretical	Auto Regressive Moving Average (ARMA)
10	Theoretical	Yule-Walker Equations
11	Theoretical	The least squares methods
12	Theoretical	Levinson-Durbin Algorithms
13	Theoretical	The methods based on eigen vector decomposition
14	Theoretical	Principal component analysis
15	Theoretical	The multisignal classification

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	8	3	154
Assignment	3	5	2	21
Project	6	3	3	36
Midterm Examination	1	6	1	7

Final Examination	1	6	1	7
			Total Workload (Hours)	225
			[Total Workload (Hours) / 25*] = **ECTS**	9
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	The following way for a signal analysis is learned
2	The defination of spectral analysis is learned
3	The nonparametric spectral analysis methods are learned
4	The nonparametric spectral analysis methods are learned
5	Principal component analysis method is learned

Programme Outcomes *(Mechanical Engineering (English) Doctorate)*	
1	1. In Mathematics, natural sciences and mechanical engineering, department has the sufficient infrastructure; the ability to use the theoretical and practical information for engineering solutions
2	2. The ability to identify, define, and solve the formula for complex engineering problems; the ability to select and apply for the appropriate analytical methods and modelling techniques
3	3. To meet desired needs of a system, system component, or process, analysing and designing skill under realistic constraints; in this respect, the ability to apply the methods of modern design
4	4. The ability to use and choose modern techniques and tools for required engineering applications and; the ability to use information technology effectively
5	5. The ability to design the experiment, collect the data for the experiment and interpret to analysing results
6	6. The ability to use computer software and hardware information, access to information and other information sources
7	7. The ability to work individually and with multidisciplinary teams effectively, taking responsibility self-confidence for complex situations
8	8. The ability to communicate with foreign colleagues by having high level of foreign language knowledge in the field of engineering
9	9. Monitoring the science and technology developments and the ability to renew itself with innovative ideas constantly
10	10. Professional and ethical responsibility awareness
11	11. Having an adequate information and awareness in the subjects of occupational safety, occupational health, social security rights, quality control and management issues of environmental protection
12	12. The ability to appreciate the effects of engineering solutions and applications in universal and social dimensions
13	13. The ability to be enlightened to the experts or non-expert audience groups on the issues related with engineering problems and solutions written and oral
14	14. The ability to have adequate knowledge and skills in the project development and application, manage the activities planning, including the projects to the employees having the responsibility of the project by increasing vocational awareness

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P1	3	5	3	4	5
P2	4	4	4	5	4
P3	5	3	5	3	3
P4	5	3	5	3	3
P5	4	4	4	4	3
P6	3	5	3	5	3
P7	3	5	3	5	4
P8	4	4	4	4	5
P9	5	3	5	3	5
P10	5	3	5	5	4
P11	4	4	4	4	4
P12	3	5	3	3	3
P13	5	5	3	3	4
P14	4	4	5	4	5