Course Specifications

Program(s) on which this course is given:	Aerospace Engineering
Department offering the program:	**Department of Aerospace Engineering**
Department offering the course:	**Department of Aerospace Engineering**
Academic Level:	MSc
Date	March 23 2015
Semester (based on final exam timing)	☐✓ Fall ☐ Spring

A- Basic Information

1. Title:	Intelligent Control			**Code:**	AER 667			
2. Units/Credit hours per week:	Lectures	2	Tutorial	1	Practical	---	Total	3

B- Professional Information

1. Course description:	This course introduces the concepts of intelligent control design of nonlinear autonomous vehicles using advanced artificial intelligent controllers based on Fuzzy logic and neural networks.
2. Intended Learning Outcomes of Course (ILOs):	**a) Knowledge and Understanding**
	Student will understand the basics of artificial neural networks
	Student will understand the basics of Fuzzy logic
	b) Intellectual Skills
	Student will be able to analyze control problem using Matlab neural networks toolbox
	Student will be able to analyze control problem using Matlab fuzzy logic toolbox
	d) General and Transferable Skills
	Student will be able to design a controller using intelligent techniques

3. Contents

Topic	**Total hours**	**Lectures hours**	**Tutorial/ Practical hours**
Introduction to intelligent control	6	4	2
Neural Network Architectures for Modeling and Control	9	6	3
Fuzzy Systems	9	6	3
Neuro-Fuzzy systems	9	6	3
Applications of intelligent control	12	6	6

4. Teaching and Learning Methods	Lectures (✓)	Practical Training/ Laboratory (✓)	Seminar/Workshop ( )
	Class Activity (✓)	Case Study ( )	Projects (✓)
	E-learning (0)	Assignments /Homework (✓)	Other:

5. Student Assessment Methods

• **Assessment Schedule**	**Week**
-Assessment 1; Project Assignments	3,5,7,9

-Assessment 2; Presentations	10
-Assessment 3; Midterm Exam	9
-Assessment 4; Final Exam	16
• **Weighting of Assessments**	
-Mid-Term Examination	20
-Final-term Examination	40
-Project	20
-Class Test	15
-Presentation	5
-Total	100

6. List of References

Intelligent Control Systems: An Introduction with Examples, Applied Optimization, ISSN 1384-6485
AuthorsKatalin M. Hangos, R. Lakner, M. Gerzson, Springer Science & Business Media, 2001

Intelligent Control: Biomimicry for Optimization, Adaptation, and Decision-Making in Computer Control and Automation, by K. M. Passino, Springer-Verlag, London, UK, 2004

7. Facilities Required for Teaching and Learning

Computer lab

Course Coordinator:	**Dr. Ayman H. Kassem**
Head of Department:	**Dr. Ayman H. Kassem**