Cairo University
Faculty of Engineering

Aerospace Engineering Department

Course Specifications

Program(s) on which this course is given:	Aerospace engineering
Department offering the program:	**Aerospace department**
Department offering the course:	**Aerospace department**
Academic Level:	4th year
Date	November, 2007
Semester (based on final exam timing)	☐ Fall ☐ Spring

A- Basic Information

1. Title:	Digital control and its applications			**Code:**		**AER-407**		
2. Units/Credit hours per week:	Lectures	3 Hrs	Tutorial	2 Hrs	Practical		Total	5 Hrs

B- Professional Information

1. Coursedescription:	**In this course, the basics of discrete and digital controllers design and implementation are taught. There is a set of skills that are acquired after having this course like:** • **Modeling, analysis and design of discrete time control system.** • **Choice of sampling period according to different characteristics.** • **Stability analysis techniques.**
2. Intended Learning Outcomes of Course (ILOs):	**a) Knowledge and Understanding**
	A1- The student should be able to know discrete control concept. A2- The student should be able to know system stability. A3- The student should be able to know sampling time and frequency
	b) Intellectual Skills
	B1- The student should plot time response for discrete systems B2- The student should improve performance of a discrete system
	c) Professional and Practical Skills
	C1- The student will implement control laws on real systems C2- The student will use simulation software to predict system performance
	d) General and Transferable Skills

3. Contents

Topic	Total hours	Lectures hours	Tutorial/ Practical hours
Discrete time system & 2 Transfer	12	8	4
Sampling and Reconstruction	10	6	4
Open & Closed loop Systems	8	4	4
Time Response characteristics	12	8	4
Digital Controller Design	10	6	4
Design in the frequency domain	8	4	4

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

5. Student Assessment Methods	
• **.Assessment Schedule**	**Week**
-Assessment 1;Class test (1)	Week 4
-Assessment 2; Class test (2)	Week 11
-Assessment 3; Reports	Week 2,5,9
-Assessment 3; Midterm Exam	Week 8
-Assessment 4; Final Exam	
• **Weighting of Assessments**	
-Mid-Term Examination	16%
-Final-term Examination	60%
-Project	-
-Class Test	-
-Semester work	24%
-Total	

6. List of References

Course notes.

Essential books: Discrete Time Control Systems By IC. Ogata, Prentice Hall , 1995

Recommended books: Digital Control Systems , Analysis and Design by Phillips & Nagle, Prentice Hall ,1992.

Periodicals, Web Sites, … etc

7. Facilities Required for Teaching and Learning

. Data Show , Screen

Course Coordinator:	Prof. Dr. Gamal M.S. EL-Bayumi
Head of Department:	Prof. Atef Sherif