SUBJECT: Further Topics in Numerical Methods			
Degree: Applied Mathematics and Computing	**ECTS: 6**	**YEAR: 3**	**TERM: 2**

WEEKLY PLANNING

WEEK	SESSION	DESCRIPTION	GROUPS		WEEKLY PROGRAM FOR STUDENT		
			LECTURES	SEMINARS	DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
1	1	**CHAPTER 1: FUNCTION APPROXIMATION** 1.1. Uniform Approximation by Polynomials - Weierstrass Theorem - Taylor's Theorem - The MiniMax Approximation Problem.	1		Sections 4.1, 4.2, 4.6, 4.7 [Atk] Section 6.1 [CB]	1.66	
1	2	(*) Discussion of selected exercises		1	(**) Problem solving for selected exercises	1.66	6.5
2	3	1.2. Approximation in the 2-norm - Least Squares Approximation	2		Section 4.3, 4.5 [Atk] Section 6.4 [CB] Section 8.2 [Burden]	1.66	
2	4	(*) Discussion of selected exercises		2	(**) Problem solving for selected exercises	1.66	6.5
3	5	- Orthogonal Polynomials - Gaussian quadrature	3		Sections 4.4, 5.3 [Atk] Section 6.3, 7.3 [CB] Section 4.7, 8.2 [Burden]	1.66	
3	6	(*) Discussion of selected exercises		3	(**) Problem solving for selected exercises	1.66	6.5
4	7	1.3. Interpolation and Trigonometric Approximation - Approximation by Trigonometric Polynomials	4		Section 3.8 [Atk] Section 6.5 [CB] Section 8.5 [Burden] Sections 10.1-10.3 [Sauer]	1.66	
4	8	(*) Discussion of selected exercises		4	(**) Problem solving for selected exercises	1.66	6.5
5	9	- Discrete Fourier Transform. Fast Fourier Transform.	5		Section 6.6 [CB] Section 8.6 [Burden] Chapter 13 [Ascher]	1.66	

5	10	**Assignment 1**		5	(***) Problem solving for selected assignments	1.66	6.5
6	11	**CHAPTER 2: COMPUTATION OF EIGENVALUES & EIGENVECTORS** 2.1. The Power Method	6		Section 9.2 [Atk] Section 9.3 [Burden] Section 12.1 [Sauer]	1.66	
6	12	(*) Discussion of selected exercises		6	(**) Problem solving for selected exercises	1.66	6.5
7	13	2.2. Householder Transformation and reduction to tridiagonal forms	7		Section 9.3, 9.4 [Atk] Sections 9.2, 9.4 [Burden]	1.66	
7	14	(*) Discussion of selected exercises		7	(**) Problem solving for selected exercises	1.66	6.5
8	15	2.3. The QR Method	8		Section 9.5 [Atk] Section 9.5 [Burden] Section 12.2 [Sauer]	1.66	
8	16	(*) Discussion of selected exercises		8	(**) Problem solving for selected exercises	1.66	6.5
9	17	2.4. Singular Value Decomposition	9		Section 9.6 [Burden] Section 12.3 [Sauer]	1.66	
9	18	**Assignment 2**		9	(***) Problem solving for selected assignments	1.66	6.5
10	19	**CHAPTER 3: Ordinary Differential Equations** 3.1. Introduction: existence, uniqueness, and stability theory	10		Section 6.1 [Atk] Section 5.1 [Burden] Section 6.1 [Sauer]	1.66	
10	20	**Midterm exam**		10		1.66	6.5
11	21	3.2. One-step methods	11		Section 6.2, 6.4, 6.5 [Atk] Section 5.2, 5.3 [Burden] Sections 6.1, 6.2 [Sauer]	1.66	
11	22	(*) Discussion of selected exercises		11	(**) Problem solving for selected exercises	1.66	6.5
12	23	3.3. Runge-Kutta Methods	12		Section 6.10 [Atk] Section 5.4 [Burden] Section 6.4 [Sauer]	1.66	
12	24	(*) Discussion of selected exercises		12	(**) Problem solving for selected exercises	1.66	6.5
13	25	3.4. Multistep Methods	13		Sections 6.3, 6.7, 6.8 [Atk] Section 5.6 [Burden]	1.66	

					Section 6.7 [Sauer]		
13	26	(*) Discussion of selected exercises		13	(**) Problem solving for selected exercises	1.66	6.5
14	27	3.5. Systems of Differential Equations 3.6. Stiffness and Absolute Stability	14		Section 6.9 [Atk] Sections 5.9-5.11 [Burden] Sections 6.3, 6.6 [Burden]	1.66	
14	28	**Assignment 3**		14	(***) Problem solving for selected assignments	1.66	6.5
SUBTOTAL						46.48+91=137.48	

15-17	27	Extra sessions, tutorials, etc. Final exam preparation					12.52
TOTAL						150	

(*) Discussion of selected exercises from the course collection that correspond to the previous large-group lecture.
(**) Problem solving for selected exercises from the course collection that correspond to the previous large-group lecture.
(***) Problem solving for selected assignments at the end of Chapter.