Engineering Mathematics II (09820MS 201201)
Spring, 2010

Class Time: T3T4 R3R4

Class Room: R511, Eng. IV

Instructor: Ta-Jen Yen (嚴大任)
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Textbooks: Advanced Engineering Mathematics (2nd edition), *Michael D. Greenberg*, 滄海書局

Grading: Quizzes (x3, 25%)
Midterms (x2, 50%)
Final (25%)

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TA Hours 7-9 pm, Wednesday (R107, MSL Building)

Content:

This subject is comprised of five parts within two semesters:

1. Ordinary Differential Equations
2. Linear Algebra
3. ***Multivariable Calculus and Field Theory***
4. ***Fourier Methods and Partial Differential Equations***
5. ***Complex Variable Theory***

In the second semester, we focus on "***Multivariable Calculus and Field Theory***", "***Fourier Methods and Partial Differential Equations***", and "***Complex Variable Theory***" to cover the rationale and of particular the engineering applications. The detailed schedule of this semester is listed below:

Class Schedule of Engineering Mathemetics (2010S)

Week	Date	Chapters	Content
1	2/23 - 2/26	**SYLLABUS**	Syllabus
		Ch. 13. DIFFERENTIAL CLACULUS OF FUNCTIONS OF SEVERAL VARIALBES	particial dervatives, chain differentiation
2	3/2 - 3/5		implicit fxns and Jacobians
			maxima and minima, Leibniz rule
3	3/9 - 3/12	**Ch. 14. VECTORS in 3-SPACE**	dot and cross product, multiple products
			differentiation of a vector fxn of a single vairable
4	3/16 - 3/19	**Ch. 15 CURVES, SURFACES, AND VOLUMES**	Quiz (1/3): ch. 13 - 14
			curve and line integrals, double and triple integrals
			surfaces & volumes, surface and volume integrals
5	3/23 - 3/26	**Ch. 16. SCALAR AND VECTORS FIELD THEORY**	divergence, gradient, curl, Laplacian
			Non-Cartesian systems, divergence theorem
6	3/30 - 4/2		Stokes's theorem, irrotational fields
			4/1 & 4/2 : holidays
7	4/6 - 4/9	**Ch. 17. FOURIER SERIES, FOURIER INTEGRAL, FOURIER TRANSFORM**	FS of a periodic fxn, half-/quarter-range expansion
			SL theory, Fourier integral
8	4/13 - 4/16	**MIDTERM (1/2)**	**Multivariable Calculus and Field Theory: Ch. 13 - 16**
9	4/20 - 4/23		Fourier transform
		Ch. 18. DIFFUSION EQUATION	definition about PDE, seperation of variables
10	4/27 - 4/30		FT and LT, the method of images
			numerical solution
11	5/4 - 5/7	**Ch. 19. WAVE EQUATION**	Quiz (2/3): ch. 17 - 18
			seperation of variables: vibration string and membrane
			d'Alembert's solution
12	5/11 - 5/14	**Ch. 20. LAPLACE EQUATION**	seperation of variables: Cartesian (and non-) coordinates
			numerical solution
13	5/18 - 5/21	**MIDTERM (2/2)**	**Fourier Mehtods and PDE: Ch. 17 - 20**
14	5/25 - 5/28	**Ch. 21. FUNCTIOS OF A COMPLEX VARIABLE**	complex numbers and plane, elementary fxns
			polar form, additional elementary fxns
15	6/1 - 6/4		Multi-valuedness, differential calculus and analyticity
		Ch. 22. COMFORMAL MAPPING	conformal mapping, bilinear transformation
			additional mappings and applications, more general BSc
16	6/8 - 6/11	**Ch. 23. THE COMPLEX INTEGRAL CLACULUS**	Quiz (3/3): ch. 21 - 22
			comples integral, Cauchy's theorem
			complex integral calculus, Cauchy integral formula
17	6/15 - 6/18	**Ch. 24. TAYLOR SERIES, LAURENT SERIES, AND THE RESIDUE THEOREM**	complex series and TS, Laurent series
			residue theorem
18	6/21 - 6/25	**FINAL EXAM**	**Complex Variable Theory: Ch. 21 - 24**

This schedule is subject to being adjusted based on actual intruction progess and students' feedback.