MTH 332/532 *DRAFT* Syllabus for **Fundamentals of Complex Analysis**, with Applications to Engineering and Science, *3rd Edition*, ©2003, by E. B, Saff and A. D. Snider

| Time | Section | Topic | Problems (Hand in those in **bold face** type) |
|---|---|---|---|
| 1.5 | 1.1 | Algebra of complex numbers | **9, 19, 20, 22**; 7, 8, 12 |
| | 1.2 | Point representation of complex numbers | **4, 6, 7bcd, 12**; 5, 8, 16 |
| 1.5 | 1.3 | Vectors and polar form | **7defg, 12, 13, 21**; 6, 10b, 28 |
| | 1.4 | The complex exponential | **2, 4, 12, 17**; 3, 6, 14 |
| 1 | 1.5 | Powers and roots | **4, 5cde, 10, 19**; 7, 11, 14, 16 |
| 1 | 2.1 | Functions of a complex variable | **1, 4, 10ab, 13ab**; 5, 6, 10cd |
| | 2.2 | Limits and continuity | **None handed in**; 11cd, 13 |
| 1 | 2.3 | Analyticity | **4, 9, 11cdef, 13**; 2, 7abd, 16 |
| 1 | 2.4 | The Cauchy-Riemann Equations | **2, 3, 5, 8**; 6, 11, 13 |
| 1 | 2.5 | Harmonic Functions | **3bcde, 7, 11, 12**; 5, 6, 18, 22 |
| 2 | 3.1 | Polynomials and Rational Functions | **3, 11, 13bcd, 14**; 1, 15, 19 |
| | 3.2 | Exponential, Trigonometric,& Hyperbolic Functions | **5, 6, 13, 17**; 7, 9abc, 18 |
| 1 | 3.3 | The Logarithmic Function | **1, 3, 6, 7**; 4, 10, 16 |
| 0.5 | 3.4 | Washers, wedges, and walls | **3, 4, 5**; 1, 2, 6 |
| 1 | 3.5 | Complex powers | **1abd, 3, 8, 11**; 2, 5, 19[Hint: $e^{2z} = (e^z)^2$.] |
| 1.5 | 4.1 | Contours | **1abc, 8, 14**; 4, 7, 13 |
| | 4.2 | Contour Integrals | **3bd, 5, 6, 12**; 7, 10, 11 |
| 1 | 4.3 | Independence of path | **1bcegh, 2, 4, 5**; 6, 7 |
| 1.5 | 4.4a | Cauchy's Integral Theorem | **4, 10, 13, 17**; 3, 16 |
| 1.5 | 4.5 | Cauchy's Integral Formula and … | **1, 4, 6, 7**; 3bcde, 11, 12 |
| 1 | 4.7 | Applications to harmonic functions | **1, 5, 6, 7**; 2, 8 |
| 1 | 5.3 | Power Series | **1a, 3cdef, 8, 12**; 7, 14, 18 |
| 1.5 | 5.5 | Laurent Series | **1, 2, 4**; 3, 6, 7ab, 10 |
| 1 | 5.6 | Zeros and singularities | **1abcdg, 2, 3, 6**; 5, 8, 12 |
| 1 | 6.1 | The Residue Theorem | **1abcd, 3abcdf, 4**; 2, 5, 6 |
| 1 | 6.2 | Trigonometric integrals over $[0, 2\pi]$ | **2, 3, 7**; 1, 9, 10 |
| 1 | 6.3 | Improper integrals… over $(-\infty, \infty)$ | **1, 4, 5, 6**; 2, 7, 9, 11 |
| *0* | *6.4* | *Improper integrals involving trigonometric functions* | |
| *0* | *6.5* | *Indented contours* | |
| 25.5 | Total | | |

LT: August 27, 2009