

A tentative syllabus for PHYS604: Methods of Mathematical Physics

Instructor: Zohreh Davoudi

Fall 2017

Date	Event	Topic(s) to be covered	Reading materials	Homework assigned	Homework due
08/29	Lecture 1	Complex analysis	Ch. 10-11 of Arfken et al.		
08/31	Lecture 2	Complex analysis	Ch. 10-11 of Arfken et al.	✓	
09/05	Lecture 3	Complex analysis	Ch. 10-11 of Arfken et al.		
09/07	Lecture 4	Complex analysis	Ch. 10-11 of Arfken et al.	✓	✓
09/12	Lecture 5	Complex analysis	Ch. 10-11 of Arfken et al.		
09/14	Lecture 6	Complex analysis	Ch. 10-11 of Arfken et al.	✓	✓
09/19	Lecture 7	Complex analysis	Ch. 10-11 of Arfken et al.		
09/21	Lecture 8	Complex analysis	Ch. 10-11 of Arfken et al.	✓	✓
09/26	Lecture 9	Complex analysis	Ch. 10-11 of Arfken et al.		
09/28	Mid-term 1	Lectures 1-9	-		✓
10/03	Lecture 10	Differential equations and special functions	Ch. 7-10 and 13-15 of Arfken et al.		
10/05	Lecture 11	Differential equations and special functions	Ch. 7-10 and 13-15 of Arfken et al.	✓	
10/10	Lecture 12	Differential equations and special functions	Ch. 7-10 and 13-15 of Arfken et al.		
10/12	Lecture 13	Differential equations and special functions	Ch. 7-10 and 13-15 of Arfken et al.	✓	✓
10/17	Lecture 14	Differential equations and special functions	Ch. 7-10 and 13-15 of Arfken et al.		
10/19	Lecture 15	Differential equations and special functions	Ch. 7-10 and 13-15 of Arfken et al.	✓	✓
10/24	Lecture 16	Differential equations and special functions	Ch. 7-10 and 13-15 of Arfken et al.		
10/26	Lecture 17	Differential equations and special functions	Ch. 7-10 and 13-15 of Arfken et al.	✓	✓
10/31	Lecture 18	Differential equations and special functions	Ch. 7-10 and 13-15 of Arfken et al.		
11/02	Mid-term 2	Lectures 10-18	-		✓
11/07	Lecture 19	Fourier series, integral transforms and integral equations	Ch. 19-21 of Arfken et al.		
11/09	Lecture 20	Fourier series, integral transforms and integral equations	Ch. 19-21 of Arfken et al.	✓	
11/14	Lecture 21	Fourier series, integral transforms and integral equations	Ch. 19-21 of Arfken et al.		
11/16	Lecture 22	Fourier series, integral transforms and integral equations	Ch. 19-21 of Arfken et al.	✓	✓
11/21	Lecture 23	Fourier series, integral transforms and integral equations	Ch. 19-21 of Arfken et al.		
11/23	Holiday	-	-		

11/28	Lecture 24	Fourier series, integral transforms and integral equations	Ch. 19-21 of Arfken et al.	✓	✓
11/30	Lecture 25	Fourier series, integral transforms and integral equations	Ch. 19-21 of Arfken et al.		
12/05	Lecture 26	Fourier series, integral transforms and integral equations	Ch. 19-21 of Arfken et al.	✓	✓
12/07	Lecture 27	Fourier series, integral transforms and integral equations	Ch. 19-21 of Arfken et al.		
TBD	Final exam	Lectures 1-27	-		✓

The primary textbook for the course is:

- *Arfken, Weber and Harris, Mathematical Methods for Physicists, Seventh Edition: A Comprehensive Guide (2012)*.

For additional resources see:

- *Saff and Snider, Fundamentals of complex analysis with applications (2003)*: a good supplementary book to expand upon topics in complex analysis.
 - *Hassani, Mathematical Physics, A Modern Introduction to Its Foundations (2013)*: a thorough book with a modern perspective. It is a pretty useful add to a physicist's bookshelf.
 - *Mathews and Walker, Mathematical Methods of Physics (1970)*: a good advanced book. It is pretty compact and light in details but is thorough and rigorous.
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