

**Syllabus For Physics 374, Fall 2014**  
**Prof. Rabi Mohapatra**

**Lecture hours: TTh 11:00 pm-12:50 pm; Room: Phys. 1204**

**Office hours: W: 3-4 pm plus other times by appointment, Contact and office : Rm 3156, Physical Science bldg; Tel. x56022  
e-mail: rmohapat@umd.edu**

### **Textbooks**

Required textbook: “Mathematical methods in the physical sciences” by M. Boas; supplementary text book “Guided tour of mathematical methods” by R. Snieder

### **Prerequisite**

MATH246 and PHYS273. co-requisite: MATH240.

### **Exams**

Two mid exams and one final exam. Grades will be based on two midterms, 100 points each; Final 200 points.

### **Grading**

The course grade will be based on weekly home works (100), mid exams (200) and final exam (200) (total 500 points). Attendance in class is required and taking advantage of office hours is encouraged and both may count towards grades in borderline cases.

**Homework rules** The home works will be typically assigned on a weekly basis. Tentative set of home works are given in the course website with due dates specified. Late home works are accepted *only under serious circumstances (to be discussed before due day)*. You are encouraged to discuss home works with other students, however the work you turn in should be your own formulation and reflection. Use of previous solutions is not allowed (violation of this rule can be a cause for failure in the course). Homework sets must show reasoning leading to the final answers in a clear and readable fashion to obtain credit. Please, include your name, write clearly and staple the pages together. You can discuss home works with me in office hours or by appointment.

### **Academic integrity**

The university has approved a code of academic integrity available on the web. The code prohibits students from cheating on exams, plagiarizing papers, submitting the same paper for credit in two courses without authorization, buying papers, submitting

fraudulent documents, and forging signatures. The university senate requires that students include the following signed statement on each examination or assignment: i pledge on my honor that i have not given or received any unauthorized assistance on this examination (or assignment). Compliance with the code is administered by a student honor council, which strives to promote a community of trust on the college park campus. Allegations of academic dishonesty can be reported directly to the honor council (314-9154) by any member of the campus community.

### Course description

Tentative course plan - will be adjusted during semester. The chapters refer to the book by Boas except occasionally from the book by Sneider as stated.

- Dimensional analysis (Sneider, Ch. 2)
- Power series (Boas, Ch. 1, Sneider Ch. 3)
- Partial Differentiation (Boas, Ch. 4, Sneider Ch. 5)
- Linear Algebra (Boas, Ch. 3)
- Vector analysis (Boas, 6)
- **First midterm** Oct. 2
- Tensor analysis (Boas, Ch.10)
- Ordinary Differential Equations (Boas Ch. 8)
- Fourier series (Boas, Ch. 7, Sneider Ch. 15)
- Special Functions (Boas, Ch. 11)
- **Second Midterm** Nov. 4
- Solutions of Differential Equations (Boas, Ch. 12)
- Partial Differential Equations (Boas, Ch. 13)
- Complex analysis (Boas, Ch. 14; Sneider Ch. 16)
- **Final Exam. Monday, Dec. 15, 8:00-10:00 AM**

**Homeworks (tentative)** All from Boas book.

- HW1: **Ch. 1:** 16.16, 16.17, 16.23,16.24, 10.2,10.17,7.3,7.8,6.5,6.8,6.12,6.18,6.29.9.5,9.6 (Due 9/11)

- HW2: **Ch. 4:** 1.12, 2.4, 2.5, 5.3, 5.7, 6.2, 6.4, 7.13, 7.15, 8.2, 8.6, 9.5, 11.1, 11.9, 12.11 (Due 9/18)
- HW3: **Ch. 3:** 9.13,9.17,9.21,10.4,10.5,11.11,11.16,11.26,11.41,11.42,11.60,12.14, 14.5,14.8,14.9 (Due 9/25)
- HW4: **Ch.6:** 3.12, 3.9, 3.8, 3.14, 4.6, 4.10, 6.13, 6.21, 7.14,8.9, 8.14, 9.10, 10.10, 11.17(Due 10/7)
- HW5: **Ch. 10:** 8.2, 8.4, 5.6, 3.4; **Ch. 8** 11.15, 11.16, 11.18, 11.21, 11.22 (Due 10/21)
- HW6: **Ch. 7:** 5.2, 5.7, 5.8, 7.13, 8.15, 8.16, 8.18, 8.20, 11.2, 11.5, 12.4, 12.9, 12.24, 12.25 (Due 10/28)
- HW7: **Ch.11:** 3.3, 3.13, 3.14, 5.4, 5.5, 7.2, 7.5, 7.8, 11.4, 11.5 **Ch. 12** 1.1, 1.2, 1.4, 1.7, 4.2, 4.4, (Due 11/11)
- HW8: **Ch. 12:** 5.4, 5.5, 5.6, 5.7, 7.4, 7.5, 10.3, 10.8, 12.4, 12.6, 13.3, 13.5, 15.1, 15.2, 15.7, 15.8, (Due 11/20)
- HW9: **Ch. 12** 16.2, 16.10, 19.2, 19.6, 21.7, 21.8, 9.1, 9.2, 9.6, 9.7 **Ch. 13:** 4.2, 4.5, 6.3, 6.5, 6.6, 6.8 (Due 12/02)
- HW10:**Ch. 14** 2.24, 2.36, 2.39, 3.3, 3.7, 3.17, 4.2, 4.5, 4.8, 4.12, 5.1, 6.27, 6.29, 6.31, 7.8, 7.27, 7.33, 7.36, 7.46, 8.10, 8.14(Due 12/11)