Course Syllabus

1. **Program of Study** Bachelor of Science (Applied Mathematics)
   College International College, Mahidol University

2. **Course Code** ICMA 333
   Course Title Boundary Value Problems

3. **Number of Credits** 4(4-0-8) (Lecture-Lab-Self study)

4. **Prerequisite** ICMA 323

5. **Type of Course** Elective major course

6. **Session / Academic Year** 1st or 3rd Trimester/academic year.

7. **Course Conditions** Maximum number of students is 30 per class.

8. **Course Description**
   Sturm-Liouville eigenvalue problems, nonhomogeneous problems, Green's function and generalized Green's function.

9. **Course Objectives**
   The course is designed to be a sequel to the course in partial differential equations. It explores a deeper aspect of such a field and provides students with a lot more tools to solve various types of partial differential equations. After successful completion of this course, students should be able to understand more clearly the nature of the boundary value problems and how to solve them.

10. **Course Outline**

Week	Topics	Hours			Instructor
		Lectures	Lab	Self study	
1-2	Sturm-Liouville eigenvalue problems, Rayleigh Quotient	8	-	16	
3-4	Nonhomogeneous problems, forced vibrating membranes and resonance, Poisson's equation	8	-	16	
5-6	Green's functions for time-independent problems	8	-	16	
7	Midterm Exam	2	-	4	
7-9	Infinite domain problems-Fourier transform solutions of partial differential equations	8	-	16	
9-11	Green's functions for time-dependent problems	8	-	16	
11	Review for final exam	2	-	4	
Final Examination					
Total		44	-	88	

11. Teaching Methods

Lecturing and problem solving.

12. Teaching Media

Transparencies, handouts and lecturing from boards.

13. Measurement and Evaluation of Student's Achievement

Student achievement is measured and evaluated by

13.1 The ability to use a lot more tools in Mathematics to solve various types of artial differential equations.

13.2 The ability to explain clearly the nature of the boundary value problems and now how to solve them.

Student's achievement will be graded according to the college and university standard using the symbols: A, B+, B, C+, C, D+, D and F.

Ratio of mark	
Assignments and quizzes (if any)	20%
Midterm examination	40%
Final examination	40%

14. Course evaluation

14.1 Students' achievement as indicated in number 13 above.

14.2 Students' satisfaction towards teaching and learning of the course using questionnaires.

15. Reference

15.1 Haberman R. Elementary applied partial differential equations: with Fourier series and boundary value problems: Prentice-Hall, Inc.; 1998.

16. Instructor

Dr. Aram Tangboondouangjit

17. Course Coordinator

Assoc. Prof. Dr. Chinda Achariyakul