COURSE SYLLABUS

1. **Program of Study**:   Bachelor of Science (Physics)
   Faculty/Institute/College: International College, Mahidol University

2. **Course Code**:   ICPY 333
   Course Title: Mathematical Methods in Physics III

3. **Number of Credits**:   4 (4-0-8) **(**Lecture/lab/Self-study)

4. **Prerequisites**:   None

5. **Type of Course**:   Elective Major course

6. **Session / Academic Year**: 1st, 2nd or 3rd Trimester/every academic year

7. **Course Conditions**:   None

8. **Course Description**:
   Numerical analysis; Error analysis, solution of nonlinear equation, interpolation and polynomial approximation, curve fitting, systems of linear equations, fast Fourier transform, numerical solution of differential equations, applications in research.

9. **Course Objectives**:
   After successful completion of this course, students will able to
   9.1 develop key concepts on the topics of numerical analysis; Error analysis, solution of nonlinear equation, interpolation and polynomial approximation, curve fitting, systems of linear equations, fast Fourier transform, numerical solution of differential equations, applications in research.

10. Course Outline

Week	Topics	Hours			Instructor
		Lecture	Lab	Self study	
1-2	Error analysis, solution of nonlinear equation	8	-	16	Dr. Udom Robkob
3-4	Interpolation and polynomial approximation, curve fitting	8	-	16	Dr. Udom Robkob
5-6	Systems of linear equations	8	-	16	Dr. Udom Robkob
7	Midterm Examination	4	-	-	Dr. Udom Robkob
8-9	Fast Fourier transform, numerical solution of differential equations,	8	-	16	Dr. Udom Robkob

10-11	Applications in research.	8	-	16	Dr. Udom Robkob
Final Examination					
Total		48	-	80	

11. Teaching Method *(s)*
       11.1 Lecture
       11.2 Suggested readings
       11.3 Discussion in class

12. Teaching Media
       12.1 Powerpoint Presentations
       12.2 Texts and teaching materials

13. Measurement and Evaluation of Student Achievement
       Student achievement is measured and evaluated by
       13.1 the ability to describe the key concepts on the topics of numerical analysis; Error analysis, solution of nonlinear equation, interpolation and polynomial approximation, curve fitting, systems of linear equations, fast Fourier transform, numerical solution of differential equations, applications in research.
       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
              Mid-term examination   40%
              Final examination   40%
              Attendance and assignment 20%
              Total   100%

14. Course Evaluation
       14.1 Evaluate as indicated in number 13 above.
       14.2 Evaluate student's satisfaction towards teaching and learning of the course using a questionnaire.

15. References:
       Stephenson G, Radmore PM. Advanced mathematical methods for engineering and science students. UK: Cambridge University Press; 1990.

16. Instructors:
       Dr. Udom Robkob

17. Course Coordinator:
       Assistant Professor Dr. Santi Watanayon