COURSE SYLLABUS

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

2. **Course Code**: ICPY 473
   Course Title: Nuclear and Particle Physics

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

4. **Prerequisites**: None

5. **Type of Course**: Required Major Course

6. **Session / Academic Year**: 2nd Trimester/every academic year

7. **Course Conditions**: None

8. **Course Description :**
   Nuclear structure, nuclear forces, radioactive decay, nuclear reaction, fission, fusion, nuclear detection and measurement, applications of radioactivity, fundamental particles and interactions, classification by quantum numbers, isospin concept, symmetries, conservation laws, quark model.

9. **Course Objectives**:
   After successful completion of this course, students will be able to
   9.1 develop key concepts in the topics of nuclear structure, nuclear forces, radioactive decay, nuclear reaction, fission, fusion, nuclear detection and measurement, applications of radioactivity, fundamental particles and interactions, classification by quantum numbers, isospin concept, symmetries, conservation laws, quark model.

10. **Course Outline**

Week	Topics	Hours			Instructor
		Lecture	Lab	Self study	
1-2	Nuclear structure, nuclear forces	8	-	16	Dr. Roppon Picha
3-4	Radioactive decay, nuclear reaction, fission, fusion	8	-	16	Dr. Roppon Picha
5-6	Nuclear detection and measurement, applications of radioactivity	8	-	16	Dr. Roppon Picha
7	Midterm Examination	4	-	-	Dr. Roppon Picha

8-9	Fundamental particles and interactions	8	-	16	Dr. Roppon Picha
10-11	Classification by quantum numbers, isospin concept, symmetries, conservation laws, quark model	8	-	16	Dr. Roppon Picha
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 nuclear structure, nuclear forces, radioactive decay, nuclear reaction, fission, fusion, nuclear detection and measurement, applications of radioactivity, fundamental particles and interactions, classification by quantum numbers, isospin concept, symmetries, conservation laws, quark model.

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:

Krane KS. Introductory nuclear physics. U.S.A.: Wiley; 1987.
Griffiths D. Introduction to elementary particles. U.S.A.: Wiley; 1987.

16. Instructors:

Dr. Roppon Picha

17. Course Coordinator:

Assistant Professor Dr. Santi Watanayon