

# ANALYTICAL MECHANICS FOR RELATIVITY AND QUANTUM MECHANICS

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Possible Course Syllabus for a Fifteen Week Semester

Week 1	Ch.1, App.A	Basic Dynamics
Week 2	Ch.2	Lagrangian Mechanics
Week 3	Ch.3	Lagrangian Constraints
Week 4	Ch.4	Hamiltonian Mechanics
Week 5	Ch.5 & 6	Variations & Hamilton's Principle
Week 6	Ch.7	Linear Operators
Week 7	Ch.8	Rotational Kinematics
Week 8	Ch.9	Rotational Dynamics
Week 9	Ch.10	Small Vibrations**
Week 10	Ch.11	Extended Lagrangian Theory
Week 11	Ch.12 & 13	Extended Hamiltonian Theory, Noether's Theorem
Week 12	Ch.14 & 15	Relativistic Kinematics*
Week 13	Ch.16	Relativistic Dynamics
Week 14	Ch.17	Canonical Transformations
Week 15	Ch.18	Generating Functions
Week 15a	Ch.19	Hamilton-Jacobi Theory**

## NOTES:

\* In a 15 week course, the more philosophical material in Chapter 14 can be touched on but need not be treated in depth. The technical topics needed for later work are in Chapter 15. The students can be encouraged to go back and study Chapter 14 during their vacations after completing the course.

\*\*Chapter 19 on the Hamilton-Jacobi theory is very difficult to fit into a 15 week course. Also, the material in that chapter is somewhat harder. This chapter may be considered as reference material for later student reading. Alternately, Chapter 10 on Small Vibrations could be omitted and Chapter 19 included at the end of the semester.