SCPY523 Classical Field Theory

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Tentative Topics

0. Introduction
1. Classical dynamics of point particle and continuum
2. Classical aspects of scalar fields
3. Classical aspects of spinor fields
4. Classical aspects of vector fields
5. Gauge symmetry and gauge field theories
6. Non-abelian Yang-Mills gauge field
7. Exact solutions of classical fields
8. General invariant and Eintein's theory of gravitation
9. Schwarzschild gravity and black hole
10. Beyond Einstein gravity
11. Conformal symmetry and field theory
12. Elements of string theory

References

1. Joel Franklin, *Classical Field Theory* (Cambridge UP, 2017)
2. Florian Scheck, *Classical Field Theory: On Electrodynamics, Non-abelian Gauge Theories and Gravitation* (Second Edition, Springer, 2018)
3. Valery Rubakov, *Classical Theory of Gauge Fields* (Princeton University Press, 2002)
4. Davison E. Soper, *Classical Field Theory* (Dover, 1976)

5. Huan Q. Bui, *Classical Field Theory-A Quick Guide* (Lecture Notes)

6. R. Aldrovandi and J. G. Pereira, *An Elementary Introduction to Classical Fields* (Lecture Notes)

7. Jeseph Conlon, *Elements of Classical Field Theory* (Lecture Notes)