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**INSTRUCTION DIVISION**

**SECOND SEMESTER 2019-2020**

# Course Handout Part II

Date: 04-01-2020

**Course Number : BITS G511**

**Course Title : Advanced Project**

**Instructor-in-charge : Dr. Prasant Samantray**

**Scope and Objective of the Course:**The course offers anintroduction to Quantum Field Theory. The student essentially learns about the Feynman Path Integral, and functional techniques in QFT. The course then delves into interacting theory for scalar fields, Feynman rules, and finally culminates in calculating the one-loop effects in scalar QFT.

**Textbooks:**

1. M. Peskin and Daniel Schroeder : An introduction to quantum field theory

**Reference books**

1. Anthony Zee :Quantum field theory in a nutshell

**Course Plan:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Lecture No.** | **Learning objectives** | **Topics to be covered** | **Chapter(s) in the Text Book** |
| 1 | Overview | Introduction to fields |  |
| 2-10 | Scalar Field Theory | Lagrangian formulation for classical fields, and conserved charges | 2,4 |
| 11-20 | Path Integral in QFT | Path integral in QM and QFT, Feynman Rules | 9 |
| 21-30 | Feynman Rules and Amplitudes | Tree and loop level Calculations in scalar QFT | 10 |
| 31-40 | Quantum corrections in QFT | Divergences and Renormalization | 11-12 |
| 41-42 | Summary | Closing remarks and challenges ahead |  |

**Evaluation Scheme:**

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| --- | --- | --- | --- | --- |
| **Component** | **Duration** | **Weightage (%)** | **Date & Time** | **Nature of Component** |
| Mid term Seminar | 30 minutes | 40 | 02-03-2020; 10 am | PPT |
| Compre Exam | 120 minutes | 60 | 30-04-2020, 10 am | Written Exam |

**Chamber Consultation Hour:**4-5pm Wednesday

**Notices:**On CMS and Physics department notice board

**Make-up Policy:Make up will be given only against the application forwarded by chief warden. No make up requests after completion of examination will be entertained.**

**INSTRUCTOR-IN-CHARGE**