PH5103 - Project in Theoretical Physics

Credits: 60.0  Semester: Whole Year
Number of Lectures:  Co-ordinator: Dr Jonathan Keeling
Academic Year: 2016-17

Overview
The project aims to survey the literature associated with the topic of the project and either (i) conduct original research into some problem in this field or (ii) prepare a research review of the field. There is no specific syllabus for this module. Students taking the MPhys degree select a project from a list of those available and are supervised by a member of the academic staff.

Aims & Objectives
This module aims to enhance student's research skills and experience through the development of a research project in theoretical physics. A key aim is to develop confidence in, and meaningful experience of, independent research. Presentation of research results is given emphasis through the production of a written report and an associated oral presentation by the student.

Learning Outcomes
At the end of the module students should

- Have had experience of developing a research area, and to build on existing knowledge through the application of new ideas.
- Have carried out a substantial independent research project.
- Have developed their critical understanding of core physics through independent study and research;
- Have further enhanced their communication skills especially in writing up the project and in presenting it at level appropriate for a final year student.
- Have developed their confidence in relation to personal research skills and undertaking research at a high level.

Synopsis
This is a project based module, the specific subject matter will be dictated by choice of project.

Pre-requisites
PH2011, PH2012, MT2001 or (MT2501 and MT2503), (PH3081 or PH3082 or [MT2003 or (MT2506 and MT2507)]), PH3062, PH3007, (PH4022 or PH4040 or PH4041), PH4032

Anti-requisites
AS4103, AS5101, PH4111, PH4796, PH5101

Assessment
Coursework (project reports, presentation, and oral examination) = 100%

Additional information on continuous assessment etc
Please note that the definitive comments on continuous assessment will be communicated within the module. This section is intended to give an indication of the likely breakdown and timing of the continuous assessment.

The topic of the project is normally chosen from a list provided by academic staff in semester one. The project usually involves working on a topic within theoretical physics that is relevant to one of our research groups. Project allocations are assigned in the middle of semester one, and some work is required before the start of semester two, in reading relevant literature (in discussion with your supervisor), leading to a short (2000 word) pre-project review that is intended to help prepare for the main project work. This document will focus on questions such as "Why am I going to do this project?", "What am I going to do", and "What evidence/science is there that will help get me there?". Thus whilst a review of the relevant literature is required, there is also a strong forward-look towards
the main part of the project. This pre-project review counts for 3 out of the 60 credits allocated to the full module, and will have a deadline for submission in week one of semester two.

The main part of the project is intended to allow the student to use their knowledge and skills to explore some aspect of theoretical physics. The work may be analytical or computational, or some combination of these. The supervision, experience, and personal reflection should allow research and related skills to be developed further. The student will meet with their supervisor at least weekly, though interaction with their supervisor and other members of the group may be more frequent than this. In order to provide some additional support students will meet with their peer-support group every two weeks.

A project report is submitted at the end of week 12. This is approximately 7500 words and typically consists of a review of relevant literature, a section on experimental or computational methods, a section on results, and a discussion/conclusions section. During the May exam diet, each student will give a presentation on their project work to an assessment panel. This is followed by the student being asked a number of questions about the science and methods etc associated with their project work.

Accreditation Matters
This module contains students developing skills and experience in project work that is required for IOP accreditation of the degree.

Recommended Books
Please view University online record:
http://resourcelists.st-andrews.ac.uk/modules/ph5103.html

General Information
Please also read the general information in the School's honours handbook.