Confirmation that this version of the module specification has been approved by the School Learning and Teaching Committee:

…………11th March 2015……………………………………….

**MODULE SPECIFICATION**

1. Title of the module

# *PH302 Computing Skills*

1. School or partner institution which will be responsible for management of the module

*School of Physical Sciences*

1. Start date of the module

*Existing module , next running from 2015-16*

1. The number of students expected to take the module

*170*

1. Modules to be withdrawn on the introduction of this proposed module and consultation with other relevant Schools and Faculties regarding the withdrawal

*None*

1. The level of the module (e.g. Certificate [C], Intermediate [I], Honours [H] or Postgraduate [M])  
   *Certificate (C).*
2. The number of credits and the ECTS value which the module represents

*15 (ECTS 7.5).*

1. Which term(s) the module is to be taught in (or other teaching pattern)

*Term 2.*

1. Prerequisite and co-requisite modules

*None*

1. The programmes of study to which the module contributes

*Physics (BSc, BSc with Foundation Year, MPhys, MPhys with Year Abroad)*

*Physics with Astrophysics (BSc, MPhys, MPhys with Year Abroad)*

*Astronomy Space Science and Astrophysics (BSc, MPhys, MPhys with Year Abroad)*

*Chemistry (BSc, BSc with Foundation Year, BSc with Year in Industry, MChem)*

*This is not available as a wild module*

1. The intended subject specific learning outcomes

*11.1 A systematic understanding of how computers work according to human’s instructions (H1).*

*11.2 Knowledge and understanding of computing programme F90 and principles, and their application to diverse areas of applications. (A1)*

*11.3 An ability to solve problems in physics/mathematics/chemistry using appropriate mathematical tools.* *Ability to use computational methods for the practical application of theory and to use information technology and data-processing skills to search for, assess and interpret chemical information and data (P: B2, C: B7)*

*11.4 An ability to use mathematical techniques and analysis to model physical behaviour using computer programming. (P: B4)*

*11.5* *Competent use of appropriate C&IT packages/systems for the analysis of data and the retrieval of appropriate information. (P: C1)*

*11.6 An ability to present and interpret information graphically using a computer. (P: C2)*

*11.7 An ability to make use of appropriate texts, research-based materials or other learning resources as part of managing their own learning, and develop simple algorithms.(P: C6)*

*11.8 Ability to recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data.**Ability to**adapt and apply methodology above to solve advanced and unfamiliar problems found in computer programming (C: B6)*

1. The intended generic learning outcomes

*12.1 Programming skills, in the context of both problems with well-defined solutions and open-ended problems. Numeracy is subsumed within this area. (D1)*

*12.2 Analytical skills – associated with the need to pay attention to detail and to develop an ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly. (D4)*

*12.3 Personal and interpersonal skills – the ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact constructively with other people within a professional environment. Including the ability to communicate and interact with professionals from other disciplines. (D5, C: D19)*

*12.4 Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information .Including the demonstration of self-direction and originality.(C: D15)*

*12.5 Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches. (C: D17)*

1. A synopsis of the curriculum

*Introduction to the concept of programming languages, and to Fortran 90 in particular.  
  
Introduction to the UNIX operating system: including text editors, the directory system, basic utilities, the edit-compile-run cycle.  
  
Introduction to Fortran 90, including the use of variables, constants, arrays and the different Fortran data types; iteration (do-loops) and conditional branching (if statements).  
  
Modular design : subroutines and functions, the intrinsic functions.  
  
Simple input/output, such as the use of format statements for reading and writing, File handling, including the Fortran open and close statements, practical read/write of data files. The handling of character variables.*

*Programming to solve physical/chemistry problems.*

1. Indicative Reading List

*Introduction to Programming with Fortran: With Coverage of Fortran 90, 95, 2003, 2008, 77; Chivers, Ian & Sleightholme, Jane, (2012) ISBN 9780857292322. Copies in library and online.*

*Programming in Fortran 90: A First Course for Engineers and Scientists; Smith, I., (1995) ISBN 0471941859*

1. Learning and Teaching Methods, including the nature and number of contact hours and the total study hours which will be expected of students, and how these relate to achievement of the intended module learning outcomes

*Contact hours: Workshops (34 hours) – 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.8, 12.1, 12.2, 12.4.*

*Total study time 150 hrs (including private study time) - 11.1, 11.2, 11.3, 11.4, 11.5, 11.7, 12.1, 12.2, 12.3, 12.5.*

1. Assessment methods and how these relate to testing achievement of the intended module learning outcomes

*Coursework 100% including class tests and homework*

*The above assessments test students’ knowledge and understanding of computers and programming (11.1, 11.2, 12.2) and application of techniques for analysis, problem solving and modelling behaviour (11.3, 11.4, 11.5, 11.6, 11.8, 12.1, 12.4). In preparation for assessments, students will need to manage their own revision using reference materials (11.7, 12.3, 12.5).*

1. Implications for learning resources, including staff, library, IT and space

*None*

1. The School recognises and has embedded the expectations of current disability equality legislation, and supports students with a declared disability or special educational need in its teaching. Within this module we will make reasonable adjustments wherever necessary, including additional or substitute materials, teaching modes or assessment methods for students who have declared and discussed their learning support needs. Arrangements for students with declared disabilities will be made on an individual basis, in consultation with the University’s disability/dyslexia support service, and specialist support will be provided where needed.
2. Campus where module will be delivered:

*Canterbury*