课程编号：1713000740

课程名称：计算物理学

学分/学时：3/48

先修课程：《高等数学》、《线性代数》、《Matlab 程序设计基础与应用》

适用专业：应用物理学

课程性质：必修

教 材：刘金远 编著. 《计算物理学》. 科学出版社. 2012 年

主要参考书 ：宫野 编著.《计算物理》. 大连理工大学出版社. 1997 年

马文淦 著. 《计算物理学》. 科学出版社. 2005 年

内容简介：（600 字以内）

计算物理学作为新兴的学科分支是物理学、数学在过去百余年来取得巨大成就的基础上，伴随着计算机科学的迅速发展而逐步发展起来的。如今，新一代的科研工作者无论是从事基础理论或实验研究，还是从事应用基础或工程研究，都必须学习和掌握计算物理的概念和方法。《计算物理学》是物理或工科本科二年级的一门基础课，其先修课程为高等数学、普通物理和计算机编程语言。本课程意在加强学生掌握数值计算的基本理论、基本方法及基本技能。本课程主要内容含括常用的典型数值方法：线性和非线性方程数值解法、近似函数方法、数值微分和数值积分方法及常微分和偏微分数值方法等；蒙特卡洛方法和分子动力学方法；有限单元法简介。

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Course Description

College of Science

Course Code：1713000740

Course Name：Computational Physics

Credit/Hours：3/48

Textbooks：Jinyuan Liu. Computational Physics. Dalian University of Technology Press. 2012

Reference Books：

Ye Gong. Computational Physics. Dalian University of Technology Press. 1997

Wengan Ma. Computational Physics.Science Press. 2005

Course Description：

COMPUTATIONAL PHYSICS is a rising course branch which was developed with the rapidly developing of computer science on the foundation of the huge success achieved in physics and mathematics field in past hundreds years. Computational physics has turn into the important part of modern physics as well as experimental physics and theoretical physics. The new generation in physics field has to learn and master the concepts and methods of computational physics whether in basical theory and experimental study or in basical adhibition and engineering research.The computational physics is physical or engineering undergraduate course of the second grade a basic course, pre-medical courses for higher mathematics, physics and computer programming language. This course aims to strengthen the students master the basic theory of numerical calculation, the basic methods and basic skills. This the main content used typical numerical methods: the linear and nonlinear equation numerical solution, approximation function method, numerical differentiation and numerical integral method and Ordinary l and partial differential numerical method, etc.; Monte carlo method and molecular dynamics methods; Finite element method introduction.