理学院（数学与应用数学专业）课程简介

课程编号：1713001280

课程名称：智能计算

学分/学时：2.5/40

先修课程：高等代数/数学分析/概率论与数理统计/MATLAB

适用专业：数学类专业

课程性质：限选

教　　　材：《计算智能》，康立山著,科学出版社,2016.01

主要参考书 ：

（1）《人工神经网络原理与实践》，陈雯柏编，西安电子科技大学出版社，2016.02

（2）《人工神经网络原理》(21 世纪重点大学规划教材)）,马锐编,机械工业出版社,2014.01。

（3）《计算智能》，张昆龙、杨文光主编, 煤炭工业出版社,2015.04

（4）《支持向量机建模及其智能优化》，王建国 张文兴主编, 清华大学出版社,2015.09

内容简介：《智能计算》是高等学校信息与计算科学、数学、应用数学、计算机科学、自动控制、信息与系统工程等专业本科三年级的一门专业基础课，其先修课程为《数学分析》（或《高等数学》），《高等代数》（或《线性代数》），《概率论与数理统计》。本课程意在加强智能计算的基本理论、基本方法及基本技能，为以后的优化计算打下良好基础。本课程内容含括人工神经网络、支持向量机、遗传算法、模糊理论和数值试验五部分。人工神经网络主要包括单层前向网络中的单层感知器、自适应线性元件和多层前向网络中的 BP 网络、径向基网络的基本理论和应用；支持向量机主要包括线性支持向量机和非线性支持向量机的基本理论和方法；遗传算法主要包括遗传算法的基本理论和方法；数值试验主要包括 MATLAB 基础知识以及如何使用 MATLAB 实现各种智能计算。

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Course Description

School of Science Faculty

Course Code：1713001280

Course Name：Intelligent Computation

Credit/Hours：2.5/40

Textbooks：《Intelligent Computation》，Kang Lishan, Science Press,2016.01

Reference Books：

（1）《Principles and Practice of Artificial Neural Network》,Chen Wenbai，Xidian University Press, 2016.02.

（2）《Principle of artificial neural network》(twenty-first Century Key University Planning Materials)，Ma Rui，Machinery Industry Press, 2014.01.

（3）《Computational Intelligence》,Zhang Kunlong, Yang Wenguang, Coal Industry Press, 2015.04.

（4）《Support Vector Machine Modeling and Intelligent Optimization》，Wang Jianguo, Zhang Wenxing, Tsinghua University Press, 2015.09.

Course Description：INTELLIGENT COMPUTATION is a professional foundational course for the third-year undergraduates with a good background in mathematical analysis (or advanced mathematics), advanced algebra (or Linear Algebra) and probability and statistics. The course is designed specially for specialties group which involves information and compute science, mathematics, applied mathematics, computer science, automatic control, information and systems engineering etc., aiming to improve the related students understanding to the intelligent computation and to lay a good foundation for optimal computation. The course covers a wide range of the basic theories and foundational knowledge including artificial neural networks, support vector machine, genetic algorithms, fuzzy theory and numerical experiments which contribute greatly to modern optimal theories and technologies. Mainly, artificial neural networks involves the basic theories and application of perceptron and adaptive linear element in single-layer neural networks, back propagation networks and radial basis function networks in multilayer perceptrons, support vector machine (SVM) and genetic algorithms involves the basic theory and method in their own field while numerical experiments includes the foundational knowledge of MATLAB and how to realize the intelligent computation by MATLAB.