

# 课程大纲

## COURSE SYLLABUS

1.	<b>课程代码/名称</b> <b>Course Code/Title</b>	EEE5058 信息技术基础
2.	<b>课程性质</b> <b>Compulsory/Elective</b>	专业核心课
3.	<b>课程学分/学时</b> <b>Course Credit/Hours</b>	3/48
4.	<b>授课语言</b> <b>Teaching Language</b>	中文或英文
5.	<b>授课教师</b> <b>Instructor(s)</b>	王建坤
6.	<b>是否面向本科生开放</b> <b>Open to undergraduates or not</b>	否
7.	<b>先修要求</b> <b>Pre-requisites</b>	(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)  无
8.	<b>教学目标</b> <b>Course Objectives</b>	(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) This course is intended to introduce to students the foundation of information technology. Upon the completion of the course, you should be able to: (1) Familiar with basic probability distributions; (2) Familiar with linear models for information regression and classification; (3) Familiar with basic neural networks and kernel methods; (4) Familiar with basic information search and iteration methods.  本课程目标是使学生了解基本的信息技术。完成本课程后, 学生可以: (1) 了解基本的概率分布; (2) 了解处理信息回归与信息分类的线性模型; (3) 了解基本的神经网络与核方法; (4) 了解基本的信息搜索与迭代方法。
9.	<b>教学方法</b> <b>Teaching Methods</b>	(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) Lecture Assignment Quiz Project Report
10.	<b>教学内容</b> <b>Course Contents</b>	(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)
	<b>Section 1</b>	Introduction 1.1 Example: Polynomial Curve Fitting 1.2 Probability Theory 1.3 Model Selection  介绍 1.1 例子: 多项式曲线拟合 1.2 概率理论

	1.3 模型选择
<b>Section 2</b>	Probability Distributions - 1 2.1 Binary Variables 2.2 Multinomial Variables  概率分布 - 1 2.1 二元变量 2.2 多变量
<b>Section 3</b>	Probability Distributions - 2 3.1 Gaussian Distribution 3.2 Nonparametric Methods  概率分布 - 2 3.1 高斯分布 3.2 非参数方法
<b>Section 4</b>	Linear Models for Information Regression - 1 4.1 Linear Basis Function Models 4.2 Bayesian Linear Regression  信息回归的线性模型 - 1 4.1 线性基函数模型 4.2 贝叶斯线性回归
<b>Section 5</b>	Linear Models for Information Regression - 2 5.1 Bayesian Model Comparison 5.2 The Evidence Approximation  信息回归的线性模型 - 2 5.1 贝叶斯模型对比 5.2 证据近似
<b>Section 6</b>	Linear Models for Information Classification - 1 6.1 Discriminant Functions 6.2 Probabilistic Generative Models  信息分类的线性模型 - 1 6.1 判别函数 6.2 概率生成模型
<b>Section 7</b>	Linear Models for Information Classification - 2 7.1 Probabilistic Discriminative Models 7.2 The Laplace Approximation  信息分类的线性模型 - 2 7.1 概率判别模型 7.2 拉普拉斯近似
<b>Section 8</b>	Neural Networks 8.1 Feed-forward Network Functions 8.2 Network Training 8.3 Error Backpropagation

	<p>神经网络</p> <p>8.1 前向网络函数</p> <p>8.2 网络训练</p> <p>8.3 误差回归</p>
<b>Section 9</b>	<p>Kernel Methods</p> <p>9.1 Dual Representations</p> <p>9.2 Constructing Kernels</p> <p>核方法</p> <p>9.1 核的表示</p> <p>9.2 核的构建</p>
<b>Section 10</b>	<p>Information Search</p> <p>10.1 Depth/Breadth First Search</p> <p>10.2 Optimal Search</p> <p>信息搜索</p> <p>10.1 深度/广度优先搜索</p> <p>10.2 最优搜索</p>
<b>Section 11</b>	<p>Dynamic Programming</p> <p>11.1 Dynamic Programming</p> <p>11.2 Markov Decision Process</p> <p>动态规划</p> <p>11.1 动态规划</p> <p>11.2 马尔可夫决策过程</p>
<b>11. 课程考核</b>	
<b>Course Assessment</b>	
	<p>(⊕考核形式 Form of examination; ⊙.分数构成 grading policy; ⊕如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)</p> <p>1. 课后作业 (20%); 2. 小测验 (10%); 3. 项目展示 (20%); 4. 期末考试 (50%)</p> <p>1.Continuous Assessment 1 (CA1): Assignment (20%)</p> <p>2.Continuous Assessment 2 (CA2): Quiz (10%)</p> <p>3.Continuous Assessment 3 (CA3): Project Presentation (20%)</p> <p>4.Continuous Assessment 4 (CA4): Final Examination (50%)</p>
<b>12. 教材及其它参考资料</b>	
<b>Textbook and Supplementary Readings</b>	
	<p>1. Bishop, C. M., &amp; Nasrabadi, N. M. (2006). Pattern recognition and machine learning (Vol. 4, No. 4, p. 738). New York: springer.</p>