

# 课程大纲

## COURSE SYLLABUS

1.	<b>课程代码/名称</b> Course Code/Title	MAE5016 高等传热学 Advanced Heat Transfer
2.	<b>课程性质</b> Compulsory/Elective	专业课（非核心课） Subject-Elective
3.	<b>课程学分/学时</b> Course Credit/Hours	3 学分 / 48 学时 3 Credits / 48 Hours
4.	<b>授课语言</b> Teaching Language	中英文 Chinese-English bilingual
5.	<b>授课教师</b> Instructor(s)	黄仕迪 副教授 Shi-Di Huang
6.	<b>是否面向本科生开放</b> Open to undergraduates or not	否 No
7.	<b>先修要求</b> Pre-requisites	（建议掌握微积分和微分方程的基础） Basic knowledge of calculus and differential equations required
8.	<b>教学目标</b> Course Objectives	
	<p>通过对本课程的学习，让学生进一步掌握高等传热学的概念和理论，并能分析求解较为复杂的传热问题。课程在加强物理概念阐述的同时，也会结合科学研究和工程实际问题，帮助学生掌握解决传热问题的基本思路、方法和技能，为学生今后从事相关工作打下必要的基础。</p> <p>In this course, students will learn the advanced concepts and theories of heat transfer, based on which they can analyse and solve more complex heat transfer problems. Besides strengthening the physical picture, this course will also introduce relevant heat transfer problems in scientific research and engineering practice, so that the students can grasp the basic knowledge, methods and skills for studying these problems, and thus lay the necessary foundation for their future work.</p>	
9.	<b>教学方法</b> Teaching Methods	
	授课 + 自由讨论 + 课程项目 Lecture + Discussion + Project	
10.	<b>教学内容</b> Course Contents	
	<b>Section 1</b>	前言；热传导绪论 Preface; Introduction to heat conduction
	<b>Section 2</b>	稳态热传导 Steady heat conduction
	<b>Section 3</b>	非稳态热传导 Unsteady heat conduction
	<b>Section 4</b>	二维热传导 Two-dimensional heat conduction
	<b>Section 5</b>	热传导问题的数值方法 Numerical method for heat conduction problem
	<b>Section 6</b>	热传导专题讨论 Open discussion on heat conduction

<b>Section 7</b>	对流绪论 Introduction to convection
<b>Section 8</b>	强迫对流：内流 Forced convection: Internal
<b>Section 9</b>	强迫对流：外流 Forced convection: External
<b>Section 10</b>	自然对流 Natural convection
<b>Section 11</b>	有相变的对流问题 Convection with phase change
<b>Section 12</b>	对流专题讨论 Open discussion on heat convection problem
<b>Section 13</b>	辐射绪论 Introduction to Radiation
<b>Section 14</b>	辐射传热 Radiation heat transfer
<b>Section 15</b>	热辐射专题讨论 Open discussion on heat radiation problem;
<b>Section 16</b>	期末复习；课程项目 Final review; Project presentation

## 11. 课程考核 Course Assessment

(① 考核形式 Form of examination; ②. 分数构成 grading policy; ③ 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.)

### 1. Final exam

2. 平时作业 Assignments 20%  
期中考试 Mid-Term Test 20%;  
课程项目 Projects 20%  
期末考试 Final exam 40%

## 12. 教材及其它参考资料 Textbook and Supplementary Readings

教材:  
教师自编 PPT

参考资料:

F. P. Incropera & D. P. DeWitt: Fundamentals of Heat and Mass Transfer (Wiley)

杨世铭、陶文铨编著:《传热学》,北京:高等教育出版社

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