课程大纲
COURSE SYLLABUS

1.	**课程代码/名称** **Course Code/Title**	MSE5034 先进复合材料学 Advanced Composite Materials
2.	**课程性质** **Compulsory/Elective**	研究生选修课 Optional courses for graduate students
3.	**课程学分/学时** **Course Credit/Hours**	3 学分/48 小时
4.	**授课语言** **Teaching Language**	英文 English
5.	**授课教师** **Instructor(s)**	徐强
6.	**是否面向本科生开放** **Open to undergraduates or not**	否
7.	**先修要求** **Pre-requisites**	（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. 教学目标
Course Objectives

（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.）

该课程是针对材料专业研究生开设的选修课。它包括基本概念和理论，不同先进复合材料（包括纳米金属有机框架材料（MOF）及其复合物和衍生物）的设计和制备合成方法学；先进复合材料的物理和化学性能及它们的应用等内容。通过课堂教学（包括论文调研及讨论）等方式使学生能够掌握复合材料的基本概念和理论，系统地了解各类先进复合材料的制备，性能和应用，以达到可以针对不同应用来选择或初步设计所需的复合材料。同时，使学生能够通过自身的理解来把握先进复合材料在未来材料学及工程领域中的角色和发展趋势。

The course is optional course for the materials graduate students. The main contents contain: fundamental theories, preparation methods/processes, physical and chemical properties, applications of advanced composite materials (including nano-MOFs and their composites and derivatives). Through lectures (including literature survey and discussions), the objectives are to make the students systematically master fundamentals of composite materials, train students to be able to select or design advanced composite materials for specific applications.

9. 教学方法
Teaching Methods

（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.）
课堂教学（包括论文调研及讨论）
Lectures (including literature survey and discussions)

10. 教学内容
Course Contents
（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.）

Section 1	Introduction
Section 2	New reinforcements
Section 3	Traditional composite materials

	Section 4	Functional composite materials
	Section 5	Functional composite materials; cement matrix-based composite materials
	Section 6	Biomimetic composite materials
	Section 7	Composite nano-materials
	Section 8	Materials composite technology
	Section 9	Materials reliability and nondestructive evaluation
	Section 10	Interfaces of composite materials
	Section 11	Composite materials and environments
	Section12	New approaches of composite materials design
	Section 13	Synthesis and properties of MOF materials and synthesis of Nano-MOFs and their composites
	Section 14	Applications of nano-MOFs and their composites
	Section 15	Synthesis of nano-MOF derivatives
	Section 16	Applications of nano-MOF derivatives

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.）

考查 70%
期末报告 30%

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

1. 复合材料，第一版，吴人洁，天津大学出版社，ISBN: 7561813899；
2. 纳米 MOF 及其复合物和衍生物，徐强，庞欢，邹如强，朱起龙，科学出版社，2021。
3. Composite Materials-Science and Engineering， Third Edition, Krishan K. Chawla, ISBN: 9780387743646;