

《人工智能时代的医学数据隐私与伦理》教学大纲

一、课程基本信息

课程名称/英文名称	人工智能时代的医学数据隐私与伦理/ Medical Data Privacy and Ethics in the Age of Artificial Intelligence	课程代码	BME2142
课程层次 ¹	研究生课程	学分/学时	3.0/48
主要面向专业 ²	生物医学工程	授课语言	中文, English
先修课程 ³	无	建议先修说明 ⁴	Python 程序设计
开课单位	生物医学工程学院	课程负责人	万之瑜

注 1: 课程层次填写“本科生课程”、“研究生课程”或“本研一体课程”

注 2: 主要填写全校 10 个本科专业（或若干个专业的组合）或“全体本科生”或“全校学生”

注 3: 显示课程信息里的“强制先修课程”信息，强制先修课程是本课程的选课强制约束条件；教师在录入课程教学大纲时，该信息显示但不可修改

注 4: 可在此填写教师对学生修读本课程之前应具备哪些知识基础的建议

二、课程简介

《人工智能时代的医学数据隐私与伦理》是生物医学工程专业研究生的一门专业选修课，也是生物医学工程专业工程硕士研究生的一门公共基础课。本课程聚焦人工智能时代下医学数据隐私与伦理问题，深入探讨医学数据的隐私保护技术、伦理困境和法律法规。课程内容涵盖医学数据在收集、共享、处理和使用过程中可能涉及的伦理挑战和隐私保护策略。通过讲座、讨论、案例分析和项目实践等形式，本课程旨在培养学生在智能医疗系统设计、生物医学数据管理方面的能力，帮助他们理解在医疗数据驱动的 AI 系统中如何平衡隐私保护与技术创新，帮助他们为未来的医疗数据处理相关工作奠定坚实的伦理、法律及技术实践基础。

本课程的内容包括四个基本模块：第一部分讲解人工智能时代的医学数据隐私与伦理的基本概念与主要挑战，第二部分讲解社会法律层面对于数据隐私与伦理的保护方案，第三部分讲

解技术层面对于数据隐私与伦理的保护方法，第四部分是实践隐私及伦理保护方法在具体案例中的应用。

三、课程教学目标

- 1.理解人工智能时代的医学数据隐私与伦理的核心概念、主要挑战和技术解决方案。
- 2.探讨人工智能在医疗数据处理中的伦理问题，如算法偏见、透明度和知情同意。
- 3.了解国内外相关法律法规（如 HIPAA、GDPR 等）对医学数据隐私的保护要求。
- 4.掌握医疗数据隐私保护的常用及前沿技术，包括差分隐私、加密方法和去识别化技术等。
- 5.培养在智能医疗中数据隐私和伦理方面的批判性思维，提升处理隐私与伦理问题的实际能力，为未来的人工智能医疗系统设计和实施提供支撑。

四、课程教学方法

本课程以课堂讲授为基础，通过小组讨论和文献阅读增强学生对于理论的理解，通过案例分析和项目实践增强学生对于理论和技术的应用，提高对实际场景中复杂的数据隐私及伦理问题的解决能力。采用课堂讲授、随堂测试、阅读理解、课后作业、案例研讨、专题讨论、课程研究项目等多种方式相结合。突出启发式的基于理解的教学方法，与国际接轨，提高学生的主动学习的热情和科研兴趣。同时可结合 MOOC、智能体 AI 小助手、专家讲座等多种方式进行教学。授课语言口语中文为主，书写英文为主。

五、课程教学内容与安排

（可按**教学周**或**章节名称**两种方式进行课程教学内容安排，列出主要知识点和教学方法。）

以教学周方式安排教学内容

时间	章节名称	主要教学内容 (主要知识点)	学时安排	教学方法 (仅列名称)
第 1 周周三	一、课程介绍与数据隐私和伦理概述	课程介绍 医学数据在 AI 时代中的作用。 数据隐私的概念及其重要性。	2	课堂讲授+ 案例讨论+ 分组讨论

9 月 16 日 15: 00- 16: 40		伦理、道德的概念及其重要性。 人工智能伦理：机器道德和伦理、自动化与就业。		
第 2 周周三 9 月 23 日 15: 00- 16: 40	二、生命科学、 医学及信息学中的 伦理问题(a)	科研伦理：人体实验、动物实验和科研的道德准则。 生命科学伦理：生殖技术、基因技术、干细胞研究等引发的争议。 信息安全隐私问题：个人数据泄露、监控技术、面部识别。 医学伦理问题：堕胎、安乐死、公共卫生问题、以及针对特殊人群（幼儿、青少年、精神病患者等）的医疗伦理问题。	2	课堂讲授+ 案例讨论
第 3 周周三 9 月 30 日 15: 00- 16: 40	二、生命科学、 医学及信息学中的 伦理问题(b)	医学伦理问题：堕胎、安乐死、公共卫生问题、以及针对特殊人群（幼儿、青少年、精神病患者等）的医疗伦理问题。	2	课堂讲授+ 案例讨论
第 4 周周六 10 月 10 日 15: 00- 16: 40	三、数据共享与 医疗 AI 的伦理 问题(a)	数据治理与数据生命周期管理。 生物医学数据共享的重要性及隐私挑战。	2	课堂讲授+ 案例讨论
第 5 周周三 10 月 14 日 15: 00- 16: 40	三、数据共享与 医疗 AI 的伦理 问题(b)	进行随堂测试 1。 医学人工智能的算法偏见与公平性问题。	2	课堂讲授+ 案例讨论
第 6 周周三	三、数据共享与 医疗 AI 的伦理 问题(c)	医学人工智能的透明度与可解释性。	2	课堂讲授+ 案例讨论

10月21日 15:00- 16:40				
第7周周三 10月28日 15:00- 16:40	四、法律法规框架	国际上 HIPAA、GDPR 等法律法规对生物医学数据的影响。 中国数据安全法和个人信息保护法。 医学数据共享的合规性要求。	2	课堂讲授+ 案例讨论
第8周周三 11月4日 15:00- 16:40	五、生物医学数据的隐私风险与常用保护技术(a)	进行随堂测试 2。 电子病历数据的隐私风险。 主要攻击模型之重识别攻击。 隐私风险评估方法。	2	课堂讲授
第9周周三 11月11日 15:00- 16:40	五、生物医学数据的隐私风险与常用保护技术 (b)	介绍基因组测序与全基因组关联研究（客座讲师）。	2	课堂讲授
第10周周三 11月18日 15:00- 16:40	五、生物医学数据的隐私风险与常用保护技术(c)	传统数据隐私保护技术：假名化、K 匿名化等。 开始课程项目选题。 布置课后作业 1。	2	课堂讲授
第11周周三 11月25日 15:00- 16:40	五、生物医学数据的隐私风险与常用保护技术 (d)	基因数据的分享及隐私风险。 主要攻击模型之成员推理攻击及重建攻击。 完成团队组建。	2	课堂讲授

第 12 周周 三 12 月 2 日 15: 00- 16: 40	五、生物医学数据的隐私风险与常用保护技术(e)	博弈论基础。 用于最优化保护的博弈论模型。	2	课堂讲授
第 13 周周 三 12 月 9 日 15: 00- 16: 40	六、医学数据隐私的高级保护技术(a)	密码学基础。 用于医学隐私计算的同态加密技术的原理及应用。 用于医学隐私计算的多方安全计算技术的原理及应用。 用于医学隐私计算的加密硬件技术的原理及应用。 差分隐私的基本原理与应用。 完成课程项目题目选择。 布置课后作业 2。	2	课堂讲授
第 14 周周 三 12 月 16 日 15: 00- 16: 40	六、医学数据隐私的高级保护技术(b)	各团队进行开题宣讲。 联邦学习模型及其在隐私保护中的应用。 合成数据生成技术及其在隐私保护中的应用。	2	课堂讲授
第 15 周周 三 12 月 23 日 15: 00- 16: 40	七、用于医疗保健的前沿 AI 技术中的隐私与伦理问题	大语言模型与生成式 AI 的介绍。 大语言模型与生成式 AI 在医学中的应用。 大语言模型与生成式 AI 的隐私风险问题。 大语言模型与生成式 AI 的公平性问题。	2	课堂讲授

		大语言模型与生成式 AI 的其他伦理问题。 大语言模型与生成式 AI 的伦理问题的解决方案及未来方向。		
第 16 周 三 12 月 30 日 15: 00- 16: 40	八、课程项目汇报	分组汇报（口头报告+壁纸海报）及点评。	2	分组汇报

以章节名称方式安排教学内容

章节名称	主要教学内容 (主要知识点)	教学周	学时安排	教学方法 (仅列名称)
/	/	/	/	/

六、考核方式和成绩评定方法

（成绩评定方法需符合《上海科技大学课程考核及成绩管理办法（试行）》文件要求。）

本课程没有期末考试，主要采用基于团队课程项目（team-based course project）的方式考核学生对教学内容的掌握。每 1-3 个学生组成团队来完成课程项目，各个团队将从课程负责人制定的选题列表选定某一自己感兴趣的项目，开展文献调研，查找现有的解决方案，发现并总结尚存的问题，并提出自己的解决思路，然后寻找相关数据集进行实验。每一个团队都需要有基于数据的实验结果，并进行口头报告汇报或壁纸海报汇报（由任课教师决定），最后以英文论文的形式提交项目报告。在提前告知并得到课程负责人同意的前提下，学生也可在选题列表之外自寻项目进行研究。课程项目的日程安排如下：

教学周	课程项目设计计划
10	发布课程项目选题，学生开始组队。
11	学生组队完成，开始选择课程项目题目。
13	各团队完成项目选题并开始准备开题报告（Project Proposal）

14	每个团队在课上进行 5 分钟的 开题宣讲 并上交 开题报告 （4-page proposal）
15	老师和助教对各团队的开题报告开展中期评定，并反馈指导意见给各团队。学生基于反馈意见，准备最终课程项目汇报(final course project presentation)
16	根据中期评定的成绩，每个排名 前 5（或 20%） 的团队在课上进行 8 分钟左右的 口头课程汇报 。时间按团队数调整，汇报顺序不提前确定。所有团队均需要制作 壁纸海报 张贴于教室墙面。授课老师、特邀专家及助教对各团队的口头报告及壁纸海报进行公平公正的打分。口头报告汇报的团队的得分将被乘以 1.2 之后与其制作的壁纸海报得分比较，择优计入总分（注：课程项目得分不可超过总分满分的 50%），而仅制作壁纸海报的团队的得分直接计入总分。最终将颁发名誉性质的 最佳口头报告奖、优秀口头报告奖、最佳壁纸海报奖、优秀壁纸海报奖以及最受欢迎壁纸海报奖 （该奖项由每位学生人手一票投出）。所有奖项有奖杯、无奖金、无额外加分。
17	学生上交 最终课程项目论文 (更新后的 10-page paper。注意：作者排名不分先后，但需要在报告中标明各人负责的部分和个人贡献。)
18	授课老师和助教对最终课程项目报告开展期末评定。

课程项目的打分比例为：**开题报告(20%)+口头/海报汇报表现(40%)+课程项目论文(40%)**。开题报告及课程项目论文的打分由助教参与评分，由授课老师最终确定。口头/海报汇报表现的得分由授课老师（60%）、特邀专家（20%）及助教（20%）加权平均获得。

总体考核比例如下表所示：

1	课程项目	50%
2	课后作业	30%
3	课前文献阅读理解	5%
4	随堂测试	10%
5	出勤与课堂表现	5%
	总分	100%

测试及提交的作业以英文为主。一共两次课后作业，包含问答题、计算题及编程题等，不允许交流合作。使用生成式 AI 工具（如 ChatGPT、DeepSeek 等）需要申明及记录版本号。两次作业的权重相等。从第二周到第十五周共 5 篇课前的文献阅读理解，按照要求写阅读小结，

平均分计入总成绩的 5%。随堂测试（闭卷）共 2 次，分别在第 5 和 8 周，分别测验 1-4 周及 5-7 周的学习效果。每次随堂测试的权重相同。课前阅读、随堂测试及课后作业的成绩和评语在四周内反馈给学生。

出勤率采取点名及抽查的方式，上课扫码点名或者随机抽取学生回答问题，如果学生不在现场并且没有请假，扣除总成绩的 1%，最多扣 5%。请事假的学生可以酌情免除扣除出勤分数。上课不积极参与的学生将被扣除总成绩的 1%。严重破坏课堂纪律的学生将被扣除总成绩的 5%。

每位学生的所有作业（包括阅读、作业、报告等）共享总共一周的宽限期。宽限期使用完后，每延迟一天提交，将扣除约一分（即总成绩的 1%）。阅读和作业可能设有加分项或加分题。

最终的总成绩按百分制换算至等级制。换算关系参考下表所示：

等级	A+	A	A-	B+	B	B-	C+	C	C-	F	EXC	P	NP	N
绩点	4.0	4.0	3.7	3.3	3.0	2.7	2.3	2	1.7	0	N/A	N/A	N/A	N/A
参考百分制转换关系	95-100	90-94	85-89	80-84	75-79	70-74	67-69	63-66	60-62	0-59	根据课程规定	≥ 60	< 60	未有成绩记录

建议如果班级规模大于 30 人，A-及以上不超过 40%，不及格率不超过 10%。

七、教材和参考书目

（需符合《上海科技大学教材选用管理办法》文件要求）

（一）推荐教材（说明：书名、作者、出版社、出版年月、ISBN 为必填项；译者为选填项）

推荐教材 1：

*书名：信息科学技术伦理与道德	*作者：杨丽凤、虞晶怡	译者：	*ISBN: 9780128163399
*出版社：机械工业出版社	*出版年月：2023 年 11 月	*版次：第 1 版	

推荐教材 2：

*书名：工程伦理	*作者：李正风、王前、丛杭青	译者：	*ISBN : 9787302524670
*出版社：清华大学出版社	*出版年月：2019 年 6 月	*版次：第 2 版	

（推荐教材信息可复制以上表格依次添加）

(二) 参考书目

参考书目 1:

*书名: Medical Data Privacy Handbook	* 作 者 : Aris Gkoulalas-Divanis, Grigorios Loukides	译者:	*ISBN : 9783319236322
*出版社: Springer	*出版年月: 2015 年 12 月	*版次: 第 1 版	

参考书目 2:

书名: Guide to the De-Identification of Personal Health Information	作 者 : Khaled El Emam	译者:	ISBN : 9780429100659
出 版 社 : Auerbach Publications	出版年月: 2013 年 5 月	版次: 第 1 版	

参考书目 3:

书 名 : Responsible Genomic Data Sharing: Challenges and Approaches	作者: Xiaoqian Jiang, Haixu Tang	译者:	ISBN : 9780128163399
出 版 社 : Academic Press	出版年月: 2020 年 3 月	版次: 第 1 版	

(参考书目信息可复制以上表格依次添加)

八、学术诚信教育

本课程高度重视学术诚信，严禁抄袭、作弊等行为。

“在学习、科研、实习实践等活动中，学生应恪守学术道德，坚守学术诚信，保护知识产权，坚持勇于创新、求真务实的科学精神，努力培养自己严谨求实、诚实自律、真诚协作的科学态度，成为良好学术风气的维护者、严谨治学的力行者、优良学术道德的传承者。”

（具体请参见《上海科技大学学生学术诚信规范与管理办法（试行）》文件要求，如果教师有更具体的要求，请详细列出。）

九、其他说明（可选）

（【建议文字格式】中文：宋体，小四；英文：Times New Roman，小四；1.5 倍行间距；首行缩进 2 字符。）

Medical Data Privacy and Ethics in the Age of Artificial Intelligence

Syllabus

1. Basic Course Information

Course Name	Medical Data Privacy and Ethics in the Age of Artificial Intelligence	Course Code	BME2142
Course Level*	Graduate	Credit/Contact Hour	3.0/48
Major	Biomedical Engineering	Teaching Language	Chinese, English
Prerequisite	N/A	Prerequisite suggestion	Python Programming
School/Institute	School of Biomedical Engineering	Instructor**	Zhiyu Wan

Notes: *Course level includes undergraduate, graduate, or undergraduate/graduate.

**If multiple instructors are involved, please list the name of team leader.

2. Course Introduction

" Medical Data Privacy and Ethics in the Age of Artificial Intelligence " is a specialized elective course for graduate students majoring in Biomedical Engineering and a foundational public course for Master of Engineering students in Biomedical Engineering. This course focuses on issues related to medical data privacy and ethics in the age of artificial intelligence (AI), with an in-depth exploration of privacy protection technologies, ethical dilemmas, and legal regulations surrounding medical data. The curriculum covers ethical challenges and privacy protection strategies that may arise during the collection, sharing, processing, and use of medical data. Through lectures, discussions, case studies, and project-based practice, this course aims to develop students' capabilities in designing intelligent medical systems and managing biomedical data. It helps students understand how to balance privacy protection with technological innovation in AI-driven healthcare data systems, and provides a solid foundation in ethics, law, and technical practices for their future work in medical data processing.

The course comprises four fundamental modules: the first part introduces basic concepts and major challenges of data privacy and ethics in the age of artificial intelligence; the second part discusses social and legal approaches to protecting data privacy and ethics; the third part covers technical methods for privacy and ethics protection; and the fourth part applies these privacy and ethics protection methods to specific cases.

3. Learning Goal

1. Understand the core concepts, main challenges, and technical solutions related to medical data privacy and ethics in the age of artificial intelligence.
2. Explore ethical issues in medical data processing with AI, such as algorithmic bias, transparency, and informed consent.
3. Learn relevant domestic and international laws and regulations, such as HIPAA and GDPR, regarding medical data privacy protection.
4. Master common and advanced techniques for medical data privacy protection, including differential privacy, encryption methods, and de-identification techniques.
5. Develop critical thinking on data privacy and ethics in intelligent medicine and enhance practical skills for addressing privacy and ethical issues to support the design and implementation of future AI healthcare systems.

4. Instructional Pedagogy

This course is primarily lecture-based, with group discussions and literature reviews to enhance students' understanding of theory, and case studies and project-based practice to strengthen their ability to apply theory and techniques. It aims to improve students' skills in solving complex data privacy and ethical issues in real-world scenarios. A combination of lectures, in-class quizzes, reading summaries, homework assignments, case discussions, special topic seminars, and course research projects is employed, emphasizing an understanding-based, heuristic teaching approach aligned with international standards. This approach encourages students' active learning and research interest. Additionally, teaching can be supplemented with MOOCs, Agentic AI helper, guest lectures, and other methods. The primary spoken language is Chinese, while written materials are primarily in English.

5. Course Content and Schedule

(You might choose one of the two course structures listed below. Please list practical training if any.)

Course Structure by Week

Week	Chapter	Teaching Contents	Contact Hours	Teaching Modes
Week 1, Wednesday Sept 16, 15:00-16:40	I. Course Introduction and Overview of Data Privacy and Ethics	Course introduction. The role of medical data in the age of AI. Concept of data privacy and its importance. Concept of ethics and morality and their importance. AI ethics: machine morality and ethics, automation, and employment.	2	Lectures, case discussions, and group discussions
Week 2, Wednesday Sept 23, 15:00-16:40	II. Ethical Issues in Life Sciences, Medicine, and Informatics (a)	Research ethics: ethical guidelines for human and animal experiments and scientific research. Life sciences ethics: controversies arising from reproductive technology, genetic technology, stem cell research, etc. Information security and privacy issues: personal data breaches, surveillance technology, facial recognition.	2	Lectures and case discussions

Week 3, Wednesday Sept 30, 15:00- 16:40	II. Ethical Issues in Life Sciences, Medicine, and Informatics (b)	Medical ethics issues: abortion, euthanasia, public health issues, and medical ethics concerning special populations (infants, adolescents, psychiatric patients, etc.).	2	Lectures and case discussions
Week 4, Saturday Oct 10, 15:00- 16:40	III. Ethical Issues in Data Sharing and Medical AI (a)	Data governance and data lifecycle management. Importance of biomedical data sharing and privacy challenges.	2	Lectures and case discussions
Week 5, Wednesday Oct 14, 15:00- 16:40	III. Ethical Issues in Data Sharing and Medical AI (b)	In-class quiz 1. Algorithmic fairness and bias issues in medical AI.	2	Lectures and case discussions
Week 6, Wednesday Oct 21, 15:00- 16:40	III. Ethical Issues in Data Sharing and Medical AI (c)	Transparency and interpretability in medical AI.	2	Lectures and case discussions
Week 7, Wednesday Oct 28, 15:00- 16:40	IV. Legal and Regulatory Frameworks	The impact of international laws and regulations like HIPAA and GDPR on biomedical data. China's data security law and personal information protection law. Compliance requirements for medical data sharing.	2	Lectures and case discussions
Week 8, Wednesday	V. Privacy Risks & Common	In-class quiz 2.	2	Lectures

Nov 4, 15:00-16:40	Privacy Protections of Biomedical Data (a)	Privacy risks of electronic health records. Main attack models: re-identification attacks. Privacy risk assessment methods.		
Week 9, Wednesday Nov 11, 15:00-16:40	V. Privacy Risks & Common Privacy Protections of Biomedical Data (b)	Introduction to Genomic sequencing and Genome-Wide Association Study (Guest Lecturer)	2	Lectures
Week 10, Wednesday Nov 18, 15:00-16:40	V. Privacy Risks & Common Privacy Protections of Biomedical Data (c)	Classic data privacy protection techniques: pseudonymization, K-anonymization, and others. Announce course project topics. HW #1 Posted.	2	Lectures
Week 11, Wednesday Nov 25, 15:00-16:40	V. Privacy Risks & Common Privacy Protections of Biomedical Data (d)	Sharing and privacy risks of genomic data. Main attack models: membership inference attacks, and reconstruction attacks. Complete team formation.	2	Lectures
Week 11, Wednesday Dec 2, 15:00-16:40	V. Privacy Risks & Common Privacy Protections of	Basics of game theory. Game-theoretic models for optimized privacy protection.	2	Lectures

	Biomedical Data (e)			
Week 13, Wednesday Dec 9, 15:00- 16:40	VI. Advanced Privacy Protections of Biomedical Data (a)	Basics of cryptography. Methods and applications of homomorphic encryption technologies for privacy-preserving computing in medicine. Methods and applications of secure multi-party computation technologies for privacy-preserving computing in medicine. Methods and applications of encrypted hardware technologies for privacy-preserving computing in medicine. Basic principles and applications of differential privacy. Complete project topic selection. HW #2 Posted	2	Lectures
Week 14, Wednesday Dec 16, 15:00- 16:40	VI. Advanced Privacy Protections of Biomedical Data (c)	Presentations of team project proposals. Methods and applications of federated learning models in privacy protection.	2	Lectures

		Methods and applications of synthetic data generation techniques in privacy protection.		
Week 15, Wednesday Dec 23, 15:00-16:40	VII. Privacy and Ethical Issues in Cutting-Edge AI Technologies for Healthcare	Basics of large language models and generative AI. Applications of large language models and generative AI in medicine. Privacy risk issues of large language models and generative AI. Fairness issues of large language models and generative AI. Other ethical issues of large language models and generative AI. Solutions to ethical issues of large language models and generative AI and future directions.	2	Lectures and case discussions
Week 16, Wednesday Dec 30, 15:00-16:40	VIII. Course Project Presentation	Group presentations (oral + poster) and feedbacks.	2	Group discussions

Course Structure by Chapter

Chapter	Teaching Contents	Week	Contact Hours	Teaching Modes
/	/	/	/	/

6. Grading Policy

This course does not have a final exam; instead, it primarily assesses students' grasp of the content through a project-based approach. Each team, composed of 1-3 students, will choose a project from a list of topics provided by the course instructor. They will conduct a literature review, investigate existing solutions, identify and summarize remaining challenges, and propose their own solutions. The teams will then seek relevant datasets to conduct experiments. Each team is required to have data-based experimental results, deliver an oral and/or poster presentation (decided by the instructor), and submit a project report in the form of a paper written in English. With prior notice and approval from the course instructor, students may also select a topic outside the provided list for topics. The schedule for the course project is as follows:

Week	Course Project Planning
10	Announce course project topics, and students begin forming teams.
11	Students complete team formation and begin selecting course project topics.
13	Each team completes project topic selection and begins preparing a project proposal.
14	Each team presents a project proposal for 5 minutes in class and submits a 4-page project proposal .
15	The instructor and teaching assistants conduct a mid-term evaluation of each team's project proposal and provide feedback and guidance to each team. Students then prepare their final course project presentation based on the feedback.
16	According to the score of mid-term evaluation, each team among top 5 (or top 20%) teams gives an in-class oral presentation of approximately 8 minutes. Timing will be adjusted based on the total number of teams, with the presentation order not disclosed in advance. All teams are required to create a poster for display on the classroom wall. The instructor, invited experts, and teaching assistants will provide fair and impartial scoring for each team's presentation and/or poster. For teams delivering an oral presentation, their oral presentation score will be multiplied by 1.2 and then compared with their poster

	score; the higher score will be counted toward the final grade. Please note that the maximal proportion allocated to the course project in the overall course grade is 50%. For teams that only create a poster, the poster score will be counted directly toward the final grade. Honorary awards will be presented, including Best Oral Presentation, Excellent Oral Presentation, Best Poster, Excellent Poster, and Most Popular Poster. The Most Popular Poster Award will be determined by student voting, with each student casting one vote. All awards will include a trophy, but no cash prize or additional grade points.
17	Students submit the final course project paper (an updated 10-page paper. Note: co-authors are listed without ranking, but each co-author's responsibilities and contributions must be specified in the report).
18	The instructor and teaching assistants conduct a final evaluation of the course project reports.

The grading breakdown for the course project is as follows: project proposal (20%) + oral/poster presentation performance (40%) + project paper (40%). The grading for the project proposal and the project paper is assisted by the teaching assistant and is finally determined by the instructor. The score for the oral/poster presentation performance is obtained through a weighted average from the instructor (60%), invited experts (20%), and teaching assistants (20%).

The overall assessment breakdown is shown in the table below:

1	Course Project	50%
2	Homework Assignments	30%
3	Reading Summaries	5%
4	In-class quizzes	10%
5	Attendances and Classroom Performance	5%
	Total	100%

Tests and submitted assignments are primarily in English. There are 2 homework assignments, which include Q&A, calculation, and programming tasks, etc. Collaboration is not allowed. Use of generative AI tools such as ChatGPT or DeepSeek need to be disclosed and documented the versions.

Each homework assignment carries equal weight. From week 2 to week 15, there are 5 required readings in total. Students are required to write summaries of the readings, which contribute 5% to the overall grade as an average score. In-class quizzes (closed-book) are given 2 times, in weeks 5 and 8, covering material from weeks 1-4 and 5-7 respectively. Each quiz carries equal weight. Grades and comments for pre-class reading summaries, quizzes, and homework assignments are provided within four weeks.

Attendance is checked using QR codes and/or randomly checked by selecting students to answer questions in class; if a student is absent without prior notice, 1% is deducted from their overall grade, up to a maximum of 5%. Students who have excused absences may have no attendance points deducted as appropriate. Students who do not actively participate in class will be deducted 1% of their overall grade. Students who seriously disrupt classroom discipline will have 5% deducted from their final course grade.

Each student has a one-week grace period in total for all their submissions (including readings, homework, project reports, etc.). For each additional day of delay, approximately one point (i.e., 1% of the overall grade) will be deducted from the submission. Readings and homework may have bonus points or questions.

The final overall score will be converted from a percentage to a letter grade. The conversion relationship is shown in the table below:

Grade	A+	A	A-	B+	B	B-	C+	C	C-	F	EXC	P	NP	N
Grade Point	4.0	4.0	3.7	3.3	3.0	2.7	2.3	2	1.7	0	N/A	N/A	N/A	N/A
Reference Percentage-to-Grade Conversion Scale	95-100	90-94	85-89	80-84	75-79	70-74	67-69	63-66	60-62	0-59	As per the course syllabus	≥ 60	< 60	No grade record

It is recommended that if the class size exceeds 30 students, no more than 40% should receive an A- or above, and the failure rate should not exceed 10%.

7. Textbook & Recommended Reading

(1) Textbook

Recommended Textbook 1:

*Book Name: 信息科学技术伦理与道德	* Authors: 杨丽凤、虞晶怡	Translator:	*ISBN: 9780128163399
* Publisher: 机械工业出版社	*Publication Month: 2023.11	* Version: 1	

Recommended Textbook 2:

*Book Name: 工程伦理	* Authors: 李正风、王前、丛杭青	Translator:	*ISBN: 9787302524670
* Publisher: 清华大学出版社	*Publication Month: 2019.06	* Version: 2	

(2) Recommended Reading

Recommended Reading 1:

*Book Name: Medical Data Privacy Handbook	*Author: Aris Gkoulalas-Divanis, Grigorios Loukides	Translator:	*ISBN: 9783319236322
*Publisher: Springer	*Publication Month: 2015.12	*Version: 1	

Recommended Reading 2:

Book Name: Guide to the De-Identification of Personal Health Information	Author: Khaled El Emam	Translator:	ISBN: 9780429100659
Publisher: Auerbach Publications	Publication Month: 2013.05	Version: 1	

Recommended Reading 3:

Book Name: Responsible Genomic Data Sharing: Challenges and Approaches	Authors: Xiaoqian Jiang, Haixu Tang	Translator:	ISBN: 9780128163399
Publisher: Academic Press	Publication Month: 2020.03	Version: 1	

8. Academic Integrity

This course highly values academic integrity. Behaviors such as plagiarism and cheating are strictly prohibited. Please list more if you have more specific requirements.

9. Other Information (Optional)