

## The Hong Kong Polytechnic University

### Subject Description Form

*Please read the notes at the end of the table carefully before completing the form.*

<b>Subject Code</b>	FSN5T01 / FSN5R07
<b>Subject Title</b>	Academic Integrity and Ethics in Science
<b>Credit Value</b>	1
<b>Level</b>	5
<b>Pre-requisite/ Co-requisite/ Exclusion</b>	None
<b>Objectives</b>	<ol style="list-style-type: none"> <li>1. To raise students' awareness of academic integrity and research ethics.</li> <li>2. To enhance students' critical thinking skills to address ethical issues and make ethical decisions.</li> <li>3. To enable students to develop deeper understanding of science, which reliability and trustworthiness are based on good practices of academic integrity and research ethics.</li> </ol>
<b>Intended Learning Outcomes</b> <i>(Note 1)</i>	<p>Upon completion of the course, students will be able to:</p> <ol style="list-style-type: none"> <li>a. Understand basic concepts and principles of academic integrity and research ethics.</li> <li>b. Avoid major misconduct in academic integrity and research ethics, e.g., fabrication, falsification, and plagiarism.</li> <li>c. Recognise ethical practices in the human and animal research requiring advance ethics approvals.</li> <li>d. Understand the ethical concerns about artificial intelligence (AI), particularly the use of generative AI (GenAI) tools such as ChatGPT in scientific writing.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b> <i>(Note 2)</i>	<p>Twelve sessions including video lectures and discussions:</p> <p><b>Session 1: Academic Integrity and Research Ethics</b></p> <p>Introduce the course structure and topics. Outline the fundamental principles of academic integrity and research ethics for scientists. Discuss the practical practice of these principles as consensus, convention, and social contract.</p> <p><b>Session 2: Scientific Research Methods</b></p> <p>Provide an overview of the historical development and philosophical explorations of scientific method. Introduce major scientific research methods, which validity, reliability, and</p>

accountability are based on academic integrity and research ethics.

### **Session 3: Evidence-based Research**

Provide an overview of evidence-based research in science. Understand the pyramid of evidence levels and some exemplary practice guidelines for evidence-based research.

### **Session 4: Human and Animal Research Ethics**

Provide an overview of research ethics in human and animal research, including advance ethical approval from Research Ethics Committees (RECs), registration of research protocols, adherence to good clinical practice (GCP), CONSORT and ARRIVE reporting guidelines, etc.

### **Session 5: Artificial Intelligence (AI) and GenAI Research**

Provide a gentle introduction to AI, particularly generative AI (GenAI) research, focusing on the successful attempts to overcome problems and limitations in developing practical applications. Discuss current pitfalls of AI research from the perspectives of the CONSORT-AI, TRIPOD, TRIPOD-AI and TRIPOD-LLM guidelines.

### **Session 6: ChatGPT for Research**

Provide an overview of possible uses/misuses of GenAI tools, particularly ChatGPT. Discuss the potential applications of GenAI for scientific research.

### **Session 7: AI and Data Science Ethics**

Discuss specific ethical issues related to the use of data science and AI in research, such as biases, privacy, and confidentiality.

### **Session 8: Plagiarism in Scientific Publications**

Discuss different forms of plagiarism and specific ethical issues related to plagiarism. Compare plagiarism with copyright infringement. Avoid plagiarism when using GenAI tools.

### **Session 9: Plagiarism in Publications (Case Study)**

Discuss a real plagiarism case in copying research.

### **Session 10: Collaboration, Contribution, and Citation**

Understand academic collaboration from the perspectives of authorship (ICMJE criteria) and contributorship (CRediT role taxonomy) to avoid authorship misconduct, citation manipulations, and misuse of citation-based metrics of journals in judging the scientific contributions of researchers.

### **Session 11: Citations of Retracted Articles (Case Study)**

	<p>Explain the practice of retractions of questionable articles and potential issues in citations of the retracted articles.</p> <p><b>Session 12: Academic Integrity Detectives</b></p> <p>Promote the awareness of unethical research, invalid ethics approval, scams from paper mills and predatory publishers/journals, including how to detect questionable research practices (QRPs) and misconduct in preparation, reviewing, and editing of scientific papers.</p>																						
<p><b>Teaching/Learning Methodology</b> (Note 3)</p>	<p><b>Lectures:</b> Backgrounds and current knowledge will be introduced. Principles and examples will be explained to highlight the ethical issues. A few guest speakers will be invited to present their challenging cases of research ethics. The cases will stimulate the students’ critical thinking and to facilitate ethical decision-making under difficult situations.</p>																						
<p><b>Assessment Methods in Alignment with Intended Learning Outcomes</b> (Note 4)</p>	<table border="1"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td>1. Individual assignment on discipline-related scenario/case analysis</td> <td>100%</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td colspan="4"></td> </tr> </tbody> </table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>1. Each student will be required to complete a few online worksheets, which are designed to reinforce understanding and correct misconceptions . The answers to the worksheet questions will contribute 45% of the total marks to the course assessment.</p> <p>A final exam will be administered at the end of the course to test whether the students can identify common misconceptions and misconduct of research. The exam will contribute 55% of the total marks to the course assessment.</p> <p>Individual students’ overall performance will be assessed to have a “Pass” or “Fail” grade.</p>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				a	b	c	d	1. Individual assignment on discipline-related scenario/case analysis	100%	√	√	√	√	Total	100 %				
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Total	100 %																						

<b>Student Study Effort Expected</b>	Class contact:	
	▪ Lectures	12 Hrs.
	▪ Voluntary consultation	1 Hrs.
	Other student study effort:	
	▪ Self-study	13 Hrs.
	▪ Worksheets	13 Hrs.
	Total	39 Hrs.
<b>Reading List and References</b>	<ul style="list-style-type: none"> <li>• Leontidis, G. (2024). Science in the age of AI: how artificial intelligence is changing the nature and method of scientific research. The Royal Society.</li> <li>• Valdés, E. &amp; Lecaros, J. A. (2023). Handbook of bioethical decisions, Volume II: scientific integrity and institutional ethics (Vol. 3). Springer Nature.</li> <li>• Rettinger, D. A. &amp; Gallant, T. B. (2022). Cheating academic integrity: lessons from 30 years of research. Wiley.</li> <li>• Faintuch, J. &amp; Faintuch, S. (2022). Integrity of scientific research: fraud, misconduct and fake news in the academic, medical and social environment. Springer Nature.</li> <li>• Iphofen, R. (2020). Handbook of research ethics and scientific integrity. Springer.</li> <li>• Saxena, A. (2019). Ethics in science: pedagogic issues and concerns. Springer.</li> <li>• Bretag, T. (2016). Handbook of academic integrity. Springer Singapore.</li> <li>• Koepsell, D. (2016). Scientific integrity and research ethics: An approach from the ethos of science. Springer.</li> <li>• Comstock, G. (2012). Research ethics: a philosophical guide to the responsible conduct of research. Cambridge University Press.</li> <li>• Cotton, D. R., Cotton, P. A. &amp; Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. Innovations in Education and Teaching International, 1-12. <a href="https://doi.org/10.1080/14703297.2023.2190148">https://doi.org/10.1080/14703297.2023.2190148</a></li> </ul>	

Note 1: Intended Learning Outcomes

Intended learning outcomes should state what students should be able to do or attain upon subject completion. Subject outcomes are expected to contribute to the attainment of the overall programme outcomes.

Note 2: Subject Synopsis/Indicative Syllabus

The syllabus should adequately address the intended learning outcomes. At the same time, overcrowding of the syllabus should be avoided.

Note 3: Teaching/Learning Methodology

This section should include a brief description of the teaching and learning methods to be employed to facilitate learning, and a justification of how the methods are aligned with the intended learning outcomes of the subject.

Note 4: Assessment Method

This section should include the assessment method(s) to be used and its relative weighting, and indicate which of the subject intended learning outcomes that each method is intended to assess. It should also provide a brief explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.

(Form AR 140) 8.2020