LIST OF COURSES OFFERED TO INTERNATIONAL STUDENTS
NON-DEGREE PROGRAM
ODD SEMESTER, ACADEMIC YEAR 2026/2027
Faculty of Mathematics and Natural Sciences - Universitas Indonesia

Course Name: Material's Characterization and Analysis
Course Code: SCMS801208
Course Credits: 4

Degree	Master Program of Materials Science (Non-degree / International student course)
Department/Study Program	Department of Physics, Faculty of Mathematics and Natural Sciences (FMIPA), Universitas Indonesia
Type of Class	English
Language of Instruction	Indonesian
Lecturer Name	Dr. Budhy Kurniawan (Coordinator); Ferry Anggoro Ardy Nugroho Ph.D.
Course Structure	Lecture (Flipped class & problem-based learning); group discussion/case study; assignments; presentations
Course Overview	This course introduces key concepts and methods in materials characterization and analysis. Students learn the fundamental properties of materials such as magnetism optics, electronics, and thermal, and the corresponding measurement principles.
Course Key Words	materials characterization; materials properties;
Academic Goal	By the end of this course, students will be able to explain and compare key materials properties (optical, electrical/semiconducting, thermal, and magnetic) and relate these properties to structure–property–application relationships. Students will be able to select appropriate characterization approaches, describe the measurement principles behind common property probes, and interpret/critically evaluate experimental data to draw scientifically sound conclusions. Students will also be able to communicate characterization results clearly through structured technical presentations and written/problem-based assignments, demonstrating teamwork and professional scientific reasoning.
Course Schedule	1. Week 1: Intro to Optical Properties of Materials 2. Week 2: Optical Properties of Metals vs Non Metals 3. Week 3: Application of Materials Optical Properties 4. Week 4: Optical Property Characterizations 5. Week 5: Electrical Properties of Materials 6. Week 6: Semiconductors

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	7. Week 7: Electrical Property Characterizations 8. Week 8: Student Presentations Thermal Properties of Materials 9. Week 9: Thermal Properties of Materials 10. Week 10: Thermal Property Characterizations 11. Week 11: Magnetic Properties of Materials 12. Week 12: Magnetic Property Characterizations 13. Week 13: Student Presentations 14. Week 14: Student Presentations
Textbooks, References, and Supplementary Materials	Required: • William D. Callister Jr., Materials Science and Engineering: An Introduction, 7th ed., 2007. • Charles Kittel, Introduction to Solid State Physics, 8th ed., 2005. Additional: • C.N. Banwell & E.M. McCash, Fundamentals of Molecular Spectroscopy, 3rd ed., 1983 (Ch. 3–4). • B.D. Cullity & C.D. Graham, Introduction to Magnetic Materials, 2nd ed., 2009. • Yves Jannot & Alain Degiovanni, Thermal Properties Measurement of Materials, 2018. • Dieter K. Schroder, Semiconductor Material and Device Characterization, 2006. • Jai Singh, Optical Properties of Materials and Their Applications, 2020.
Grading Component	- Test: 60% - Presentation: 10% - Discussion: 10% - Assignment: 20%
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to attend regularly and on time, participate actively, maintain respectful behavior, and uphold academic integrity (no plagiarism or cheating).

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NON-DEGREE PROGRAM
ODD SEMESTER, ACADEMIC YEAR 2026/2027
Faculty of Mathematics and Natural Sciences - Universitas Indonesia

Course Name: Scientific Literacy
Course Code: SCMS802201
Course Credits: 1

Degree	Master Program of Materials Science (Non-degree/International student course)
Department/Study Program	Department of Physics, Faculty of Mathematics and Natural Sciences (FMIPA), Universitas Indonesia
Type of Class	International
Language of Instruction	English
Lecturer Name	Prof. Vivi Fauzia, Ferry Anggoro Ardy Nugroho Ph.D., Januar Widakdo Ph.D.
Course Structure	Lecture (Flipped class & problem-based learning); cooperative learning; paper and presentation
Course Overview	This course develops students' scientific literacy, focusing on research ethics and sources of knowledge, publication ethics, and practical skills for navigating scholarly publications and scientific writing.
Course Key Words	scientific literacy; research ethics; publication ethics; bibliometrics; references; scientific writing
Academic Goal	By the end of this course, students will be able to apply principles of research integrity and publication ethics (e.g., authorship, plagiarism avoidance, responsible citation, and misconduct awareness) in real research scenarios. Students will be able to find, evaluate, and synthesize scholarly literature using effective search strategies and indexing/bibliometric tools, and maintain systematic documentation of their literature review process. Students will be able to manage references professionally with appropriate tools and produce a well-structured scientific manuscript and presentation that meets academic standards of clarity,

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Course Schedule	1. Week 1: Course introduction; ethics and sources of knowledge 2. Week 2: Research integrity and academic ethics (case discussions) 3. Week 3: Publication ethics (authorship, plagiarism, misconduct) 4. Week 4: Overview of scholarly publishing ecosystem; journals vs. conferences 5. Week 5: Classification of national and international publications 6. Week 6: Mapping and databases (indexing, metrics, impact indicators) 7. Week 7: Managing references (reference managers, organizing literature) 8. Week 8: Critical reading strategies; evaluating sources 9. Week 9: Author identity (ORCID) and author performance indicators 10. Week 10: Literature search strategies and systematic documentation 11. Week 11: Scientific writing techniques: structure and style 12. Week 12: Scientific writing techniques: figures, citations, and paraphrasing 13. Week 13: Drafting paper and preparing presentation 14. Week 14: Paper/presentation c linic and peer feedback 15. Week 15: Final paper and presentation submission/presentation
Textbooks, References, and Supplementary Materials	• On Being a Scientist: A Guide to Responsible Conduct in Research, Third Edition, National Academy of Sciences, USA, 2009. • Pedoman Publikasi Ilmiah, Lukman, Suminar Setiadi Ahmadi, Wasmen Manalu, Deden Sumirat Hidayat, Kemenristekdikti Dirjen Penguatan Riset dan Pengembangan, 2017. • Related digital library resources.
Grading Component	• Paper and presentation: 100%
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to attend regularly and on time, participate actively, maintain respectful behavior, and uphold academic integrity (no plagiarism or cheating).