Module designation	**History and Ethnomathematics** **Indonesian title:** *Sejarah dan Etnomatematika* **Course code:** 8421203053
Semester(s) in which the module is taught	Semester 5 (Third year)
Person responsible for the module	**Coordinator:** Dr. Rini Setianingsih, M.Kes. **Teaching staff:** Prof. Rooselyna Ekawati, Ph.D.; Evangelista Lus Windyana Palupi, S.Pd., M.Sc.; Dr. Lisnani, M.Pd.
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lectures, tutorial assignments, and individual study **Media and tools:** Slides and LCD projectors, whiteboard
Workload (incl. contact hours, self-study hours)	**(Estimated) total workload:** 3 CU × 170 minutes × 16 weeks = 8,160 minutes = 136.00 hours (≈ 4.77 ECTS) **Contact hours:** lectures, 3 × 50 minutes per week × 16 weeks = 40.00 hours (class hours per week: 510 minutes = 8.50 hours, including structured activities) **Private study including examination preparation:** structured assignments, 3 × 60 minutes per week × 16 weeks = 48.00 hours; independent study, 3 × 60 minutes per week × 16 weeks = 48.00 hours (total 96.00 hours)
Credit points	3 CU (4.77 ECTS) *1 CU = 170 minutes per week × 16 weeks = 45.3 hours; 1 ECTS = 28.48 hours (144 CU = 229 ECTS), so 1 CU = 1.59 ECTS (UNESA Rector's Decree No. 736/HK/KM/2023).*
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	**Programme learning outcomes (PLO) addressed:** • PLO-6: Demonstrate mathematical knowledge and insight. • PLO-7: Demonstrate pedagogical knowledge in designing, implementing and evaluating mathematics learning. • PLO-8: Design, implement and evaluate mathematics learning using IT.
Content	Studying mathematics as a body of knowledge that has developed historically and evolved within diverse social and cultural contexts. The topics cover the development of mathematical ideas, concepts, and representations in number, geometry, algebra, trigonometry, probability and statistics, and calculus, as well as the contributions of various civilisations to their development. Students investigate Indonesian ethnomathematical practices through the study of primary and secondary sources and fieldwork to identify, document, analyse, and interpret mathematical ideas and activities embedded in community cultural practices. The findings from historical and ethnomathematical investigations are subsequently used as a foundation for designing contextualised, inclusive, and meaningful mathematics learning by integrating historical, cultural, and technological perspectives. Teaching and learning activities employ Case Study and Project-Based Learning (PjBL) approaches through

<table>
<tr><td></td><td>critical discussions, presentations, analysis of primary and secondary sources, field investigations, and projects involving the development of mathematics learning materials and/or instructional media. Artificial intelligence (AI) and information and communication technology (ICT) are used critically, ethically, and responsibly to support information retrieval and verification, the visualisation and reconstruction of mathematical concepts or artefacts, data transcription and coding, formative feedback, and the production of instructional media. All information or outputs generated with AI assistance must be verified against credible academic and/or primary sources, and the use of AI must be disclosed transparently. Identifiable community or informant data must not be uploaded to AI services without valid consent. These activities must adhere to research ethics, privacy, data security, and respect for the knowledge and cultural rights of communities. Students develop a research article on the history of mathematics and ethnomathematics and submit it to an academic journal. The Ethnomathematics and History of Mathematics course contributes primarily to SDG 4 (Quality Education) by promoting contextualised, inclusive, critical, and culturally responsive mathematics learning. It also supports SDG 10 (Reduced Inequalities) by fostering appreciation for diverse knowledge systems and cultures, and SDG 11 (Sustainable Cities and Communities) by promoting the preservation and educational use of cultural heritage as a resource for mathematics learning.</td></tr>
<tr><td>Examination forms</td><td>Final score is calculated from the weekly assessment scheme below (CLO/PLO addressed and weight of each assessment):
<table>
<tr><th>Week</th><th>CLO</th><th>PLO</th><th>Weight (%)</th></tr>
<tr><td>1</td><td>CLO-1</td><td>PLO-6</td><td>5</td></tr>
<tr><td>2</td><td>CLO-6</td><td>PLO-6</td><td>5</td></tr>
<tr><td>3</td><td>CLO-6</td><td>PLO-7</td><td>5</td></tr>
<tr><td>4</td><td>CLO-6</td><td>PLO-7</td><td>10</td></tr>
<tr><td>5</td><td>CLO-6</td><td>PLO-7</td><td>5</td></tr>
<tr><td>6</td><td>CLO-1</td><td>PLO-8</td><td>5</td></tr>
<tr><td>7</td><td>CLO-1</td><td>PLO-8</td><td>5</td></tr>
<tr><td>8</td><td>CLO-1</td><td>PLO-8</td><td>10</td></tr>
<tr><td>9</td><td>CLO-1</td><td>PLO-8</td><td>5</td></tr>
<tr><td>10</td><td>CLO-3</td><td>PLO-8</td><td>10</td></tr>
<tr><td>11</td><td>CLO-3</td><td>PLO-8</td><td>5</td></tr>
<tr><td>12</td><td>CLO-3</td><td>PLO-8</td><td>5</td></tr>
<tr><td>13</td><td>CLO-3</td><td>PLO-8</td><td>5</td></tr>
<tr><td>14</td><td>CLO-6</td><td>PLO-8</td><td>5</td></tr>
<tr><td>15</td><td>CLO-4</td><td>PLO-8</td><td>5</td></tr>
<tr><td>16</td><td>CLO-4</td><td>PLO-8</td><td>10</td></tr>
</table></td></tr>
<tr><td>Study and examination requirements</td><td>Students are considered competent and pass if the final score calculated from the score of midterm exam, assignments, participation, and final exam is at least 55 or C.
Final index (grade conversion):
<table>
<tr><th>Index</th><th>Converted score</th><th>Score range (A = final score)</th></tr>
</table></td></tr>
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	A | 4.00 | 85 ≤ A ≤ 100 A- | 3.75 | 80 ≤ A < 85 B+ | 3.50 | 75 ≤ A < 80 B | 3.00 | 70 ≤ A < 75 B- | 2.75 | 65 ≤ A < 70 C+ | 2.50 | 60 ≤ A < 65 C | 2.00 | 55 ≤ A < 60 D | 1.00 | 40 ≤ A < 55 E | 0.00 | 0 ≤ A < 40
Reading list	1. Romero Sánchez, S., Serradó Bayés, A., Appelbaum, P., & Aldon, G. (Eds.). (2023). The Role of the History of Mathematics in the Teaching/Learning Process: A CIEAEM Sourcebook. Springer. https://doi.org/10.1007/978-3-031-29900-1 2. Chorlay, R., Clark, K. M., & Tzanakis, C. (2022). History of mathematics in mathematics education: Recent developments in the field. ZDM – Mathematics Education, 54, 1407-1420. https://doi.org/10.1007/s11858-022-01442-7 3. Thomsen, M., Jankvist, U. T., & Clark, K. M. (2022). The interplay between history of mathematics and digital technologies: A review. ZDM – Mathematics Education, 54(7). https://doi.org/10.1007/s11858-022-01368-0 4. Vandendriessche, E., & Pinxten, R. (Eds.). (2023). Indigenous Knowledge and Ethnomathematics. Springer. https://doi.org/10.1007/978-3-030-97482-4 5. Setianingsih, R., Budiarto, M. T., Wijayanti, P., Manoy, J. T., & Hidayat, D. (2023). Etnomatematika: Pengantar Studi Budaya dan Matematika.Numerasia. 6. Katz, V. J. (2008). A History of Mathematics: An Introduction (3rd ed.). Addison-Wesley. 7. Ascher, M. (2005). Mathematics Elsewhere: An Exploration of Ideas Across Cultures. Princeton University Press. 8. Fiangga, S. (2021). Modul Perkuliahan Sejarah Matematika: Pengantar Sejarah Matematika untuk Pembelajaran Matematika. 9. Wijayanti, P., Lisnani, L., Purnomo, H., Mauladaniyati, R., Sumarni, F., Fadhil, Z. N., Tsaniyah, S. M., & Nugroho, G. E. (2025). Etnomatematika: Mengenal lebih dekat konsep etnomatematika di Museum Trinil berbasis Augmented Reality. Bekasi: PT Dewangga Energi Internasional. 10. Wijayanti, P., Lisnani, L., Purnomo, H., Sumarni, S., Mauladaniyati, R., Fadhil, Z. N., … Sunzuma, G. (2026). Integrating Augmented Reality and Ethnomathematics in Trinil Museum-Based Mathematics Education to Support Sustainable Development Goals. Mathematics Education Journal, 20(3), 851– 872. https://doi.org/10.22342/mej.v20i3.pp851-872