

# Management of Solid and B3 Waste (Hazardous and Toxic Materials)



**MASTER PROGRAM OF ENVIRONMENTAL SCIENCE  
SCHOOL OF POSTGRADUATE STUDIES  
DIPONEGORO UNIVERSITY**



**A Module Handbook or collection of module descriptions that is also available for students to consult should contain the following information about the individual modules:**

|                                                       |                                                                                                                                                                                                           |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module design                                         | Management of Solid and B3 Waste (Hazardous and Toxic Materials)                                                                                                                                          |
| Module level, if applicable                           |                                                                                                                                                                                                           |
| Code, if applicable                                   | CIL-2-2-732                                                                                                                                                                                               |
| Subtitles, if applicable                              |                                                                                                                                                                                                           |
| Courses, if applicable                                |                                                                                                                                                                                                           |
| Semester(s) in which the module is taught             | 2 <sup>nd</sup> Semester                                                                                                                                                                                  |
| Person responsible for the module                     | Prof. Dr. Ir. Syafrudin CES., M.T.                                                                                                                                                                        |
| Lecturer                                              | 1. Dr. Eng. Maryono, ST, MT                                                                                                                                                                               |
| Language                                              | <i>Indonesian and English</i>                                                                                                                                                                             |
| Relations to curriculum                               |                                                                                                                                                                                                           |
| Type of teaching, contact hours                       | <i>Lecture: 60 minutes<br/>Q&amp;A: 10 minutes<br/>Discussion: 10 minutes<br/>Presentation: 10 minutes</i>                                                                                                |
| Workload                                              | <i>(Estimated) workload, divided into contact hours (lecture, exercise, laboratory session, etc.) and private study, including examination preparation, specified in hours,<sup>1</sup> and in total.</i> |
| Credit points                                         | <i>2 credits</i>                                                                                                                                                                                          |
| Requirements according to the examination regulations | <i>Minimum attendance of lectures 75%</i>                                                                                                                                                                 |
| Recommended prerequisites                             | <i>eg existing competences in...</i>                                                                                                                                                                      |

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<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because of the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

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| Module objectives/intended learning outcomes                | <ul style="list-style-type: none"> <li>• Students can understand and explain the need for solid waste management</li> <li>• Students can understand and explain the need for solid waste management</li> <li>• Students can understand and explain the need for B3 waste management</li> <li>• Students can understand and explain the need for B3 waste management.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Content                                                     | <p>This course aims to equip students with knowledge, understanding, and application of various solid waste and B3 processing methods. The lectures discussed various types of solid waste, B3 waste, solid waste management systems, and B3 waste management systems with various aspects. Learning activities include lectures with various approaches and methods that involve students a lot, such as discussions, observation activities in the field to learn to identify problems and solutions, learn to identify problems and their solutions.</p>                                                                                                                                                                                                                                                                                                                                                                                                  |
| Study and examination requirements and forms of examination | <ul style="list-style-type: none"> <li>• <i>Open book and close book</i></li> <li>• <i>Multiple choice, case study, interview, practice</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Media employed                                              | <i>Powerpoint, youtube, website</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Reading list                                                | <ol style="list-style-type: none"> <li>1. Arif Zulkifli, 2014, <i>Pengelolaan Limbah Berkelanjutan</i>, Graha Ilmu, Jogjakarta.</li> <li>2. Christensen, T.H., R. Cossu, and R. Stegmann, 1998, <i>Landfilling of Waste: Leachate, Barriers, Biogas</i> (3 volume set), Chapman &amp; Hall.</li> <li>3. Tchobanoglous, G., 1993, <i>Integrated Solid Waste Management: Engineering Principles</i>, McGraw-Hill Book Company, New York.</li> <li>4. Wilson,D.C., 1981, <i>Waste Management: Planning, Evaluation, Technologies</i>, Clarendon Press, Oxford.</li> <li>5. Weinstein,N.J., and R.F. Toro, 1976, <i>Thermal Processes of Municipal Solid Waste for Resource and Energy Recovery</i>, Ann Arbor Science, Michigan</li> <li>6. UU No. 18 tahun 2006 tentang <i>Pengelolaan Sampah</i>.</li> <li>7. Tammemagi, H. Y.,1999, <i>The Waste Crisis: Landfills, Incinerators, and the Search for a Sustainable Future</i>,ISBN 0-19-512898-2.</li> </ol> |