

MODUL HANDBOOK MASS TRANSFER AND TRANSPORFIMATION



MASTER PROGRAM OF ENVIRONMENTAL SCIENCE
SCHOOL OF POSTGRADUATED STUDIES
DIPONEGORO UNIVERSITY

Modul Description :

Module designation	Mass Transfer and Transformation
Semester(s) in which the module is taught	2 nd Semester
Person responsible for the module	Prof. Dr. Ir. Purwanto, DEA. Dr. Ing. Sudarno, S.T., M.Sc. Prof. Dr.-Ing Suherman, ST, MT
Language	Indonesian and English
Relation to curriculum	Elective
Teaching methods	Mix Method or Blended Learning by incorporating Lecture Based-learning, Student Centred-Learning and Technological Learning <ul style="list-style-type: none">• Lecture Based-Learning: teacher lead a lesson by using presentation, showing visual• Student Centred-Learning: teacher promote individual learning so that student can exploring individual idea• Technological Learning, teacher leads to use high technology in information such as by exploring, utilizing internet/searching engine and social media.
Workload (incl. contact hours, self-study hours)	<ul style="list-style-type: none">• Lecture, 2 hours per week• Discussion and presentation (Q&A), 1 hours per week• Individual assignment, 3 hours per week• Total workload for semester = 100 hours
Credit points	2 credits / 4 ECTS
Required and recommended prerequisites for joining the module	No required prerequisite
Module objectives/intended learning outcomes	<ul style="list-style-type: none">• Able to formulate environmental management theory from the perspective of mass transfer and transformation• Able to formulate and carry out scientific research to solve environmental problems from the perspective of mass transfer and transformation• Able to formulate rules, methods through of environmental management to improve the quality of life from the perspective of mass transfer and transformation

	<ul style="list-style-type: none"> • Able to solve environmental problems with a technical engineering approach from the perspective of mass transfer and transformation
Content	<p>The mass transfer and transformation course aims to equip students with knowledge, understanding and application of Mass Transfer and Transformation. Lectures discuss various types of mass transfer and transformation 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 their solutions, learn to identify problems and their solutions.</p>
Examination forms	<ul style="list-style-type: none"> • Essay • Case studies • Practicals.
Study and examination requirements	<p>Lecture attendance of at least 75%.</p>
Reading list	<ol style="list-style-type: none"> 1. Mauro, A. and Massarotti, N. 2020. Heat and Mass Transfer in Energy Systems. MDPI Ventras, JS, and Vrentas, CM 2013, Diffusion and Mass Transfer First Edition. CRC Press 2. Cotta, R. M., Lisboa, K. M., Curi, M. F., Balabani, S., Quaresma, J. N., Perez-Guerrero, J. S., ... & Amorim, N. S. (2019). A review of hybrid integral transform solutions in fluid flow problems with heat or mass transfer and under Navier–Stokes equations formulation. Numerical Heat Transfer, Part B: Fundamentals, 76(2), 60-87. 3. Lisboa, K. M., de Souza, J. R. B., Naveira-Cotta, C. P., & Cotta, R. M. (2019). Heat and mass transfer in hollow-fiber modules for direct contact membrane distillation: Integral transforms solution and parametric analysis. International Communications in Heat and Mass Transfer, 109, 104373. 4. Delgado. JMPQ 2017. Heat and Mass Transfer Processes: New Developments and Applications II. Trans Tech Inc. Publications 5. Reddy, G. V., Ibrahim, S. M., & Bhagavan, V. S.

	<p>(2014). Similarity Transformations Of Heat And Mass Transfer Effects On Steady Mhd Free Convection Dissipative Fluid Flow Past An Inclined Porous Surface With Chemical Reaction. <i>Journal Of Naval Architecture & Marine Engineering</i>, 11(2).</p> <ol style="list-style-type: none">6. Rashidi, M. M., Rahimzadeh, N., Ferdows, M., Uddin, M. J., & Bég, O. A. (2012). Group theory and differential transform analysis of mixed convective heat and mass transfer from a horizontal surface with chemical reaction effects. <i>Chemical Engineering Communications</i>, 199(8), 1012-1043.7. Anantharaman. 2011. <i>Mass Transfer: Theory and Practice</i>. India: Prentice Hall India Learning Private Limited.8. Dutta, BK 2007. <i>Process Principles of Mass Transfer and Separation</i>. PHI9. Bejan, A., & Kraus, A. D. (Eds.). (2003). <i>Heat transfer handbook (Vol. 1)</i>. John Wiley & Sons.
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