UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF CHEMISTRY
1 Colombo Street Yogyakarta 55281
Phone (0274) 565411, Ext. 1398, Fax (0274)548203
Website: http://kimia.fmipa.uny.ac.id, E-mail: kimia@uny.ac.id

Module name:	Polymer Chemistry
Module level, if applicable:	Undergraduate
Code:	KIM 6204
Sub-heading, if applicable:	-
Classes, if applicable:	2
Semester:	5th
Module coordinator:	Prof. Dr. Eli Rohaeti
Lecturer(s):	Prof. Dr. Eli Rohaeti
Language:	Bahasa Indonesia and English
Classification within the curriculum:	Compulsory Subject
Teaching format / class hours per week during the semester:	100 minutes lectures, 120 structured activities and 120 individual study per week
Workload:	Total workload is 90,67 hours per semester which consists of 100 minutes lectures, 120 structured activities and 120 individual study per week for 16 weeks
Credit points:	2 SKS (3 ECTS)
Prerequisites course(s):	Molecular Dinamycs
Course Outcomes	After taking this course, the students are expected to be able to: CO1 Describe the synthesis method of polymer modification in chemical research CO2 Analyzing the synthesis of polyurethanes based on natural materials and their applications in the community CO3 Explain the benefits of chitosan glycerol cellulose composites as an innovative biomedical application
Content:	Discuss the basic concepts of polymer science, polymerization reactions, polymerization characterization, polymeric properties and polymer development based on research that has been done. Development of basic concepts and global trends in polymer science. 1. Synthetic Polymers 2. Condensation Polymerization and Polymerization of Free Radical Additions 3. Ionic Polymerization and Coordination Chain 4. Chemical Transformation and Degradation of Polymers 5. Solubility and Solubility Parameters of Polymers 6. The Reology and Mechanical Properties of Polymers 7. Analysis of Polymer Thermal Properties

<table>
<tr><td></td><td>8. Function Cluster Analysis and Crystallinity of Polymers
9. Surface Analysis and Molar Mass of Polymers
10. Natural Material Based Polyurethane Synthesis and its
11. Application
12. Biocomposite
13. Composite Cellulose Chitosan Glycerol for Biomedical Applications</td></tr>
<tr><td>Study / exam achievements:</td><td>Attitude assessment is carried out at each meeting by observation and/or self-assessment techniques using the assumption that basically every student has a good attitude. The student is marked very good or not good attitude if they show it significantly compared to other students in general. The result of attitude assessment is not taken into account in the final grades, but as one of the requirements to pass the course. Students will pass from this course if at least have a good attitude. The final mark will be weight as follow:
<table>
<tr><th>No</th><th>CO</th><th>Assessment Object</th><th>Assessment Technique</th><th>Weight</th></tr>
<tr><td>1</td><td>CO1,
CO2,
CO3.</td><td>a. Participation
b. Assignment
c. Mid-term exam
d. Final Exam</td><td>Presentation / written test</td><td>5%
25%
30%
40%</td></tr>
<tr><td colspan="3"></td><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Forms of media:</td><td>Handout, Board, LCD Projector, Laptop/Computer, Module</td></tr>
<tr><td>References:</td><td>

1. Eli Rohaeti (2017). Kimia Polimer. Yogyakarta : UNY Press
2. Eli Rohaeti (2015). Sintesis Poliuretan Ramah Lingkungan. Yogyakarta : UNY Press
3. F. W. Billmeyer (2003). Textbook of Polymer Science. Amerika : John Wiley & Sons. Inc.
4. Malcolm P. Stevens (2003). Kimia Polimer. Jakarta : PT Pertja.
5. Rohaeti, E., Budiasih, K. S., Rakhmawati, A., Nuraini, E., & Kusumastuti, C. (2019). Assessment of extract of musa paradisiaca Linn. in producing nanoparticles to enhance quality of nylon fabric. *Rasayan Journal of Chemistry. 12(3)*, 1352-1359. DOI: http://dx.doi.org/10.31788/RJC.2019.1235179
6. Rohaeti, E. Kasmudjiastuti, R S. Murti, & D. Irwanto. (2020). Enhancement of antibacterial activity of suede leather through coating silver nanoparticles synthesized using *piper betle*. *Rasayan Journal of Chemistry. 13(1)*, 628-635. DOI: http://dx.doi.org/10.31788/RJC.2020.1315516
7. Rohaeti, E., Mujiyono, & Rochmadi. (2015a). Biokomposit dari serat rami dan sekresi kutu lak termodifikasi dengan lateks terhidrasi dan tidak terhidrasi. *Majalah Kulit, Karet, dan Plastik*. *31(1)*, 23-35

</td></tr>
</table>

	8. Rohaeti, E., Mujiyono, & Rochmadi. (2015b). Modification of lac insect secretion with citric acid as natural matrix in preparation of biocomposite. *Proceeding of ICRIEMS 2015*, Yogyakarta, C35-C46 9. Rohaeti, E., Mujiyono, & Rochmadi. (2016). Modification of lac insect secretion by using adipic acid as matrix in preparation of biocomposite. *Proceeding of ICRIEMS 2016*, Yogyakarta, C49-C97 10. Rohaeti E, Pratomo H. (2011). Bioplastik nata de casava sebagai bahan edible film ramah lingkungan. *Jurnal Penelitian Saintek. 16(2)*, 172-190 11. Rohaeti, E. & Rakhmawati, A. (2017a). Application of terminalia catappa in preparation of silver nanoparticles to develop antibacterial nylon. *Oriental Journal of Chemistry. 33*(6), 2905–2912. DOI: https://doi.org/10.13005/ojc/330625 12. Rohaeti, E. & Rakhmawati, A. (2017b). Antibacterial activity and the hydrophobicity of cotton coated with hexadecyltrimethoxysilane. *AIP Conference Proceedings* (USA: American Institute of Physics), 020010-1 - 020010-9. DOI:10.1063/1.4995096A. 13. Rohaeti, E. & Rakhmawati, A. (2018). Application of silver nanoparticles synthesized by using *Ipomoea batatas* L. waste to improve antibacterial properties and hydrophobicity of polyester cloths. *Chiang Mai Journal of Science. 45*(7), 2715–2729.

PLO and CO mapping

	PLO									
	Attitude	**General Skill**		**Knowledge**				**Specific Skill**		
	PLO1	**PLO2**	**PLO3**	**PLO4**	**PLO5**	**PLO6**	**PLO7**	**PLO8**	**PLO9**	**PLO10**
CO1					√					
CO2										
CO3								√		√