

## Module Handbook

Module Name:	Natural Product Chemistry
Module Level:	Bachelor
Abbreviation, applicable: if	KIO 305
Sub-heading, applicable: if	-
Courses included in the module, applicable: if	Phytochemistry Method, Synthesis Organic Compounds, Elucidation of Organic Structure
Semester/term:	7 <sup>th</sup> / Fourth year
Module coordinator(s):	Dr. Mulyadi Tanjung, MS
Lecturer(s):	Dr. Suyanto, M.Si
Language:	Bahasa Indonesia
Classification within the curriculum	Elective course
Teaching format / class hours per week during semester:	2 hours lecture (50 min / hour)
Workload:	2hours lecture, 2hours individual activities, 2 hours structured activities, 13weeks per semester, and total 78hours per semester ~ 2,6 ECTS *
Credit Points:	2
Requirements:	Elucidation of Organic structure
Learning goals/competencies:	<p><b>General competence (Knowledge):</b> Able to describe the basic principles of the formation reaction of compound classes and biosynthetic pathway of terpenoids, steroids, polyketides, flavonoids, stilbenoid, xanthonones and alkaloids.</p> <p><b>Specific Competence:</b></p> <ol style="list-style-type: none"> <li>able to determine the biosynthetic pathway of secondary and primary Metaboli compound</li> <li>Able to apply malonic acid biosynthesis pathway in the formation of classes of compounds terpenoids, steroids and polyketides</li> <li>Able to apply amino acid biosynthetic pathway in the formation of compounds alkaloids</li> <li>Able to apply skhimat biosynthesis pathway by which the compound phenyl group propanoid</li> <li>5. able to implement merging lanes and paths skhimat acetate malonate in which the compound flavonoid biosynthesis, xanthonones and stilbenoid.</li> </ol>
Content:	Diversity of secondary metabolites compounds include classes of compounds terpenoids, steroids, arilpropanoid, flavonoids, stilbenoid, alkaloids, xanthonones and polyketide classification on terms of classification, biosynthesis, structure diversity profile, chemotaxonomic, chemical properties, and chemical synthesis.
Attribute Soft skill	Team-work and good communication
Study/exam achievements:	Students are considered to be competent and pass if at least get 55

	<p><b>Final score is calculated as follows:</b>  Middle exam (UTS) = 35% ; final exam (UAS) = 35%  Structured activities = 20% ; Softskill = 10 %</p> <p><b>Final index is defined as follow:</b>  A : 100 &gt; NA ≥ 75  AB : 74,99 &gt; NA ≥ 68  B : 68 &gt; NA ≥ 60  BC : 60 &gt; NA ≥ 55  C : 55 &gt; NA ≥ 50  D : 5 &gt; NA ≥ 45  E : 45 &lt; NA</p>
Learning Methods	<ul style="list-style-type: none"> <li>- lecture</li> <li>- Discussion</li> </ul>
Forms of Media:	LCD, computer, White board, internet
Literature:	<ol style="list-style-type: none"> <li>1. Achmad, S.A., Hakim, E.H., Makmur, L., Syah, Y.M. Juliawati, L.D., dan Mujahidin, D., 2007, Tumbuh-tumbuhan Obat Indonesia, ITB Press, Bandung</li> <li>2. Andersen, O.M., and Markham, O.M., 2006, Flavonoids: Chemistry, Biochemistry and Aplications, CRC Press, Taylor and Francis Group</li> <li>3. Cordell, G.A., 2002., The Alkaloids: Chemistry and Pharmacology, Academic Press Inc.</li> <li>4. Dewick, P.M., 2009. <i>Medicinal Natural Products: A Biosynthetic Approach</i>, 3<sup>rd</sup> Ed., John Wiley &amp; Sons, Inggris</li> <li>5. Ramawar, K.G., and Merillon, J.M., 2008, Bioactive Molecules and Medicinal Plants, Springer-Verlag Berlin Heidelberg</li> <li>6. Vermerris, W., and Nicholson, R., 2006, Phenolic Compound Biochemistry, Springer.</li> <li>7. Jurnal-jurnal yang berkaitan dengan kimia bahan alam</li> </ol>
Notes:	<p>*Total ECTS = {(total hours workload x 50 min ) / 60 min } / 25 hours  <b>Each ECTS is equals with 25 hours</b></p>