



**University of Gadjah Mada**  
 Faculty of Forestry  
 Study Program of Doctor in Forestry Science  
**Module Handbook**

<b>Name (Code)</b>	: Bioactivity of Essential Oils (KTDT22805)						
<b>ECTS   Type   Status</b>	: 7.5   Class lecture   Elective						
<b>Semester   OfL:OnL Ratio   LMS</b>	: 2   60:40   elok.ugm.ac.id						
<b>Pre-Requisite</b>	: -						
<b>Description of content</b>	: This course discusses the history and development of essential oils, essential oil biosynthesis, essential oil chemical testing (GCMS analysis), essential oil chemical composition, understanding and bioactivity of essential oils, essential oil chemistry (GCMS analysis), chemical composition of essential oils, understanding and bioactivity of essential oils (antioxidant, anti-fungal, anti-insect, anti-inflammatory, anti-microbial, and aromatherapy), analysis of bioactivity and the biochemical mechanism of essential oils of forestry plants.						
<b>Course Outcomes and PLO mandated</b>	Finishing this course, student will be able to differentiate the various characteristics of essential oil producing materials essential oils, processing technology and characteristics of essential oils (CO1/PLO3), to compare various methods and analysis of essential oil testing and the physic-chemical properties of essential oils (CO3/PLO4), and to synthesize various kinds of bioactivity as well as the mechanism of bioactivity of essential oils (CO4/PLO7).						
<b>Lecturer(s)</b>	<ol style="list-style-type: none"> <li>Rini Pujiarti, S.Hut., M.Agr., Ph.D.</li> <li>Prof. Dr. Ganis Lukmandaru, S.Hut., M.Agr.</li> </ol>						
<b>Workload</b>	: Total workload per semester is for 14 weeks, with weekly activities: 2*(50' lectures, 60' structured activities, 60' independent study), and 2 mid exam and final exam weeks.						
<b>Learning Method</b>	: Class Lecture and Discussion						
<b>Student Learning Experience</b>	: Actively discuss the class material and research cases, structured assignment, group work, quiz, material reflection, review of literature and problem in forestry sectors						
<b>Mapping CO-syllabus</b>	<b>CO</b>	<b>Syllabus</b>	<b>Learning form</b>	<b>Meetings</b>			
	1	<ol style="list-style-type: none"> <li>History and Development of Essential Oils.</li> <li>Essential Oils in General</li> <li>Chemical Components of Essential Oils</li> </ol>	Class lecture and discussion	4			
	2	<ol style="list-style-type: none"> <li>Essential Oil Chemical Analysis</li> <li>Bioactivity of Essential Oils</li> <li>Essential Oil Insecticides (1 and 2)</li> <li>Essential Oil Antifungal</li> </ol>	Class lecture and discussion	5			
	3	<ol style="list-style-type: none"> <li>Essential Oil Anti-Inflammatory</li> <li>Essential Oil Aromatherapy</li> <li>Essential Oil Antioxidant</li> <li>Other Essential Oil Bioactivities</li> </ol>	Class lecture and discussion	5			
<b>Assessment method</b>	<b>Base of Evaluation</b>		<b>Component of Evaluation</b>	<b>CO1</b>	<b>CO2</b>	<b>CO3</b>	<b>Total (%)</b>
	Participative activity		Assignment	√	√	√	40
	Cognitive & Psychomotoric		Mid exam	√	√		30
	Case Study result		Final exam/ presentation		√	√	30
<b>References</b>	<ol style="list-style-type: none"> <li>Baser, K.C.B., G. Buchbauer. 2010. Handbook of Essential Oil, Science, Technology and Application. CRC Press, London, New York.</li> <li>Berger, R.G. 2007. Flavours and Fragrances: Chemistry, Bioprocessing and Sustainability. Springer Berlin Heidenberg, New York</li> <li>Guenther, E. 2007. The Essential Oils. Vol.1: History-Origin in Plant- Production-Analysis. Jepson Press.</li> <li>Sell, C.S. 2003. A Fragrant Introduction to Terpenoid Chemistry. The Royal Society of Chemistry, Cambridge, UK</li> <li>Tisserand, R., and Young, R. 2013. Essential Oil Safety. Churhill Livingstone, Elsevier.</li> <li>White, G.L. 2013. Essential Oil and Aromatherapy. White Willow Books.</li> </ol>						