Module designation	**Fertilizers and Fertilization**
Semester(s) in which the module is taught	*4th semester*
Person responsible for the module	*Dr. Ir. Fakhrur Razie, M.Sc* *Dr. Afiah Hayati, SP., MP* *Ir. Hairil Ifansyah,MP* *Dr. Gusti Irya Ichriani, SP., MP.*
Language	*Bahasa Indonesia*
Relation to curriculum	*Compulsory courses*
Teaching methods	*Teaching, practice*
Workload (incl. contact hours, self-study hours)	- *Total workload: 121,69 hours* *Contact hours:* - *Lecture: 79.24 hours* - *Practice:42,45hours* *Private study including examination preparation: 48 hours*
Credit points	*3*
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	*Students are able to:* *a. apply knowledge and knowledge about fertilizers and fertilization on land for sustainable biomass* *b. apply thinking Scientific research in the field of fertilizers and fertilization that pays attention to occupational health and safety (safety, health and environment / SHE)* *c. analyzes land management systems in terms of fertilizers and appropriate fertilization to carry out sustainable biomass production on marginal lands, especially Wetlands according to applicable regulations*

Module designation	**Fertilizers and Fertilization**
Content	*To provide a strong knowledge base for graduates in managing agricultural land is a wise and prudent, necessary study materials on fertilizers and fertilization so that the optimal productivity of agricultural land can be acquired and sustainability can be maintained. Therefore, every student is required to take the course Fertilizer and Fertilizer (ETKB 204) which is presented in Semester 4. In accordance with the competency mapping, this course is mandated to fulfill the competence of graduates, namely being able to design appropriate land and land management to carry out sustainable biomass production.* *Learning is done through tutorials by providing knowledge and directing students (learners) to develop knowledge, thinking skills and psychomotor skills through direct interaction with learning resources designed in the syllabus, RPKPS and RPKPM. In the learning process, students carry out learning activities with a scientific approach (scientific approach) which includes: observing, asking questions, gathering* *information, associating or analyzing, and communicating what they have found in analytical activities and practicing in an experiment* *conducted in a practicum group. The learning process is carried out directly and indirectly. The direct learning process (instructional effect)* *produces direct knowledge and skills. Indirect learning is directed at developing values and attitudes during the direct learning process.* *Learning activities are designed based on activities, which encourage students to learn to be active, innovative and creative.*
Examination forms	*Quiz, mid-semester exams, final exam, and Practicum report*
Study and examination requirements	*Overall score is above 70 (B)* *Minimum attendance is 80% for lecture and 100% for practice/response*

Module designation	**Fertilizers and Fertilization**
Reading list	1. *Black, CA Soil Fertility Evaluation and Control. CRC Press, Lewis Publisher, Bocaraton, Florida.* 2. *FAO. 2000. Fertilizer and Their Use: A Pocket Guide for Extension Officers. Food and Agriculture Organization of The United Nations and International Fertilizer Industry, Rome.* 3. *Havlin, JL, Tisdale, JD Beaton, and WL Nelson. 2004. The Soil as a Natural Resource. Blackwell Publishing, Boston.* 4. *Havlin, JL, Tisdale, JD Beaton, and WL Nelson. 2013. Soil Fertility and Fertilizers, 8th Edition. Pearson. United States.* 5. *Gowariker, V., VN Krishnamurthy, S. Gowariker, M. Dhanorkar, and K. Paranjape. 2009. The Fertilizer Encyclopedia. John Wiley &* 6. *Sons, Inc. Publications. The United States of America. P 25, 706.* 7. *Sanchez. P. A, 1976 Properties and Management of Soil in the Tropic. John Wiley and Sons New York* 8. *Walsh, L. M and JD Beaton, 1973. Soil Testing and Plant Analysis, SSSA Inc., Madison.* 9. *Fred Leiwakabessy, FM 1988. Soil Fertility Lecture Material. Department of Soil, Faculty of Agriculture, Bogor Agricultural University.* 10. *Tisdale, SL, Nelson, WL, Beaton. JD 1985. Soil Fertility and Fertilizers. Macmillan Publishing Company. New York, NY.*