



BACHELOR IN FOOD & AGRICULTURAL PRODUCT TECHNOLOGY

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MODULE HANDBOOK APPLIED MATHEMATICS

Module designation	Applied Mathematics
Module code	TPHP211206
Module level	Bachelor
Semester(s) in which the module is taught	Semester 2 / Even Semester
Person responsible for the module	Dr. Ir. Devi Yuni Susanti, S.T.P., M.Sc., IPU, ASEAN Eng. Dr. Sri Rahayoe, S.T.P., M.P. Dr. Inasanti Pandan Wangi, S.T.
Language	Indonesian
Relation to curriculum	Compulsory Courses
Teaching methods	Case-based learning
Workload (incl. contact hours, self-study hours)	- Lectures $2 \text{ credits} \times 50 \text{ minutes} \times 16 \text{ meetings} = 1600 \text{ minutes}$ $= 26.67 \text{ hours}$ $= 26.67 \text{ hours}/30 \text{ hours}$ $= 0.89 \text{ ECTS}$ - Structured Assignments $2 \text{ credits} \times 60 \text{ minutes} \times 16 \text{ meetings} = 1920 \text{ minutes}$ $= 32 \text{ hours}$ $= 32 \text{ hours}/30 \text{ hours}$ $= 1.07 \text{ ECTS}$ - Self-study $2 \text{ credits} \times 60 \text{ minutes} \times 16 \text{ meetings} = 1920 \text{ minutes}$ $= 32 \text{ hours}$ $= 32 \text{ hours}/30 \text{ hours}$ $= 1.07 \text{ ECTS}$ Total workload = 3.03 ECTS (90.67 hours)
Credit points	2 credits / 3.03 ECTS



Required and recommended prerequisites for joining the module	No requirement needed			
Module objectives/intended learning outcomes	Programme Learning Outcome (PLO)			
	PLO P4	Be able to use the principles of food engineering, food preservation and processing, packaging materials and methods, cleaning and sanitation, and water and waste management		
	Module Learning Outcome (MLO)			
	MLO P4.22	Be able to formulate material and heat balances in certain food processing processes		
Content	1. Introduction: Learning Contract, Module Syllabus, Motivation to apply applied mathematics, Pretest 2. Differential: Standard differential and partial differential formulas 3. Differential of a function, multiplication and division of functions, logarithmic functions 4. Differential applications in agricultural engineering 5. Task seminar "Formulation and Solution of Differential Cases in Food Processes" 6. Integrals: Standard integral formula, function integrals, bounded integrals 7. Numerical integrals of positive and negative areas 8. Advanced integrals, Applications of integrals in Agricultural engineering 9. Integral Case Resolution in Food Processes" 10. Meaning of Differential Equation, Solution of Differential Equation 11. Usefulness of Differential Equations in the field of food processing (Case studies of parameter changes proportional to time and parameters) 12. Usefulness of Differential Equations in the field of food processing (Case studies of changes in population, quality, 1st and 2nd order kinetics) 13. Usefulness of Differential Equations in the field of food processing (another case study: solution mixing) 14. Assignment seminar "Formulation and Solution of Differential Equation Cases in Food Processing"			
Examination forms	Evaluation Base	Evaluation Components	MLO	Percentage
	A. Participatory Activities	Discussion	-	-
	B. Case Study Results	Presentation	MLO P4.22	20%
		Report	-	-



		Midterm Exam	-	-
		Final Exam	-	-
	C. Cognitive	Skill-Based Assessment (SBA)	-	-
		Quiz	MLO P4.22	20%
		Midterm Exam	MLO P4.22	30%
		Final Exam	MLO P4.22	30%
		Total		100%
Study and examination requirements	The final grade in the module is composed of (20% project results and 80% cognitive). Students must attend 75% of the total meetings to take the exam.			
Reading list	1. Erwin Kreyszig, 1988, Advanced. Engineering Mathematics, John Wiley& Sons, Inc. 2. Fiuizio, N And G Lades, 1982, Ordinary Differential Equations, Wadsworth Inc., English. 3. Rabenstein, A.L., 1975, Elementary Differential Equations With Linear Algebra, Second Edition, Academic Press Inc, New York 4. Potter, MC, 1978, Mathematical Methods In The Physical Sciences, Prentice-Hall, Inc, USA. 5. Stroud, K.A., 1978, Engineering Mathematics, 3rd edition, The Macmillan Press Ltd, English.			
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