THAI NGUYEN UNIVERSITY
UNIVERSITY OF AGRICULTURE AND FORESTRY

SYLLABUS

Course: Sustainable Agriculture

Code : ……

Number of credits: 03

Major:

Thai Nguyen, 2024

THAI NGUYEN UNIVERSITY
UNIVERSITY OF AGRICULTURE AND FORESTRY

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

Thai Nguyen, 2024

SYLLABUS

I. General information of module:

- Name of module: Sustainable Agriculture
- Code:
- Number of credits: 03
- Module:
- Conditions to participate in learning modules:

The previous courses:

Prerequisite courses: (insert only name of prerequisite course if any, if no, write "no")

** The names of the courses listed must be exactly same as in the curriculum*

- Time distribution: n credits (a/b/c)

(In there: **n**: Number of credits

a: the number of theoretical lessons in class

b: the number of lessons in the LAB, or the computer or workshop practice, if there is no, write "0";

c: number of self-study lessons, c = n x 15 x 2).

- Module of knowledge block:

Basis □		**Major core courses** □		**Major** □		**Supplementary** □	
Compulsory □	Elective □	Compulsory □	Elective □	Compulsory □	Elective ☒	Compulsory □	Elective □

Language of instruction: English ☒ Vietnamese □

II. Information of lecturer

2.1. Lecturer 1:

Dr. Ha Viet Long

Organization: Department of Plant Production, Faculty of Agronomy, TUAF

Office Location: Faculty of Agronomy, TUAF

Email: havietlong@tuaf.edu.vn

Consultation hours: 9:00 – 11:00 Monday – Friday

Mr. Ha Viet Long obtained his Msc. of Agricultural Studies from University of Queensland - Australia in 2017. His field of study focus on food crops such as rice, sorghum and legumes crops.

2.2. Lecturer 2:

Dr. Truong Thi Anh Tuyet

Organization: Faculty of Environment, TUAF

Telephone: 0916938087 Email: truongthianhtuyet@tuaf.edu.vn

Truong Thi Anh Tuyet finished her PhD in 2019 from Murdoch University in Australia. She has more than 10 years experiences in the environment, agriculture, and sustainability.

III. Course description

This course explores the principles and practices of sustainable agriculture. Students Students will explore environmentally friendly and socially responsible approaches to food production, integrating concepts of climate smart agriculture. The course will cover various sustainable and climate smart agricultural techniques including organic farming, permaculture, agroforestry, and regenerative agriculture. The course will cover topics such as soil health, water management, biodiversity conservation, crop rotation, integrated pest management, and sustainable livestock production. Additionally, the course will examine the economic, social, and ethical dimensions of sustainable agriculture, including its potential to enhance food security, adapt and mitigate climate change, and promote rural development.

IV. Course objectives (*Each writing module should not exceed 4 goals, each writing goal should not exceed 2 lines, the highest competence level is 3*)

Goals	Describe your goal *(This module equips for students :)*	Outcomes of training program	Competence level
G1	Understand the principles and goals of sustainable and climate smart agriculture	4	2
G2	Familiarize with various sustainable and climate smart agricultural practices	4	2
G3	Analyze the environmental, economic, and social impacts of conventional agriculture versus sustainable and climate smart agriculture	4	2
G4	Develop practical skills for implementing sustainable agricultural practices on farms and in other agricultural settings	4	3

V. Outcomes of the course (*n= 4 – 6 output standard)*

Course objectives	Outcomes of the course	Describe the outcomes of the course *(After completing this module, learners need to achieve)*	Outcomes of training program	Competence level
G 1	O1	Gain a comprehensive understanding of the principles and goals underlying sustainable and climate-smart agriculture	1	2
G 2	O2	Acquire knowledge about various	2	2

		sustainable and climate-smart agricultural practices, such as organic farming, agroforestry, and water-efficient irrigation techniques, along with their applications and benefits.		
G3	O3	Develop the ability to critically analyze and evaluate the environmental, economic, and social impacts of conventional agriculture versus sustainable and climate-smart agriculture, considering factors such as resource conservation, biodiversity, resilience, and equity.	1	2
G4	O4	Develop practical skills necessary for implementing sustainable agricultural practices, including soil management, water conservation, integrated pest management, and adoption of climate-resilient crop varieties, with an emphasis on hands-on learning and field-based experiences.	4	2
	O5	Enhance problem-solving and decision-making abilities in the context of agricultural sustainability, by applying knowledge and skills to identify and address challenges related to climate change adaptation, resource management, and food security.	3,4,8	2
	O6	Improve communication and collaboration skills necessary for engaging with diverse stakeholders, including farmers, policymakers, and community members, to promote the adoption of sustainable agricultural practices and foster collective action towards achieving sustainable development goals.	8,9	2

Note: Correlation between the course's objectives and the learning outcomes of the course and learning outcomes of the training program

The matrix contribution for the course's outcomes (summarized from the table above)

Code	**Name of course**	**The standard contribution level of the training program**							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	Sustainable Agriculture		2						

Roadmap to develop knowledge, skills and attitudes of module

Content	Satisfy the learning outcomes of the course					
	1	**2**	**3**	**4**	**5**	**6**
1. Introduction to Sustainable and Climate Smart Agriculture	a					
2. Soil Health and Carbon Sequestration	b	b				
3. Water Management for Climate Resilience	b	b				
4. Biodiversity Conservation in Agriculture	b	b				
5. Pest and diseases control	b	b				
6. Organic Farming and Carbon Footprint Reduction				c	c	c
7. Economic, Social Equity and Climate Resilience in Agriculture			b			

Note: C is the highest ability level of the module

VI. Detail content of the course

Content	Number of lessons	Outcomes of the course	Competence level	Teaching methods	Evaluation methods	Teaching location
1. Introduction to Sustainable and Climate Smart Agriculture • Definition and principles of sustainable agriculture • Climate change impacts on agriculture • Introduction to climate smart agriculture • Sustainable and climate smart agriculture practices	6	1,2	2	Lecturing, Brainstorming, group discussions	Observation, ask questions and assessing students' answers, quizizz game	Classroom
References: 1, 3, 7, 17, 21, 22,23						
2. Soil Health and Carbon Sequestration • Importance of soil health in production and carbon sequestration • Principles in soil conservation and management • Carbon farming practices: cover cropping, no-till agriculture, and biochar • Carbon measurement and monitoring in agricultural soils	6	**1,2**	2	Lecturing, Brainstorming, group discussions	Observation, ask questions and assessing students' answers, quizizz game	Classroom
References: 8, 15, 17, 18						

3. Water Management for Climate Resilience • Sustainable irrigation practices in the context of climate change • Water-efficient farming techniques • Managing water resources in a changing climate	3	**1,2**	2	Lecturing, Brainstorming, group discussions	Observation, ask questions and assessing students' answers, quizizz game	Classroom
References: 4, 5, 9, 17						
4. Biodiversity Conservation in Agriculture • Importance of biodiversity in agriculture • Understanding key concepts: genetic diversity, species diversity, ecosystem diversity • Linkages between biodiversity conservation and sustainable agriculture • Agricultural Practices for Biodiversity Conservation	3	**1,2**	2	Lecturing, Brainstorming, group discussions	Observation, ask questions and assessing students' answers, quizizz game	Classroom
References: 2, 17, 22						
5. Pest and diseases control • Biological, cultural, and mechanical pest control methods • Minimizing pesticide use through Integrated pest management strategies	3	**1,2**	2	Lecturing, Brainstorming, group discussions	Observation, ask questions and assessing students' answers, quizizz game	Classroom
References: 12, 13, 16, 17, 22						

6. Organic Farming and Carbon Footprint Reduction • Introduction to Organic Farming and Organic farming practices for carbon emission reduction • Principles and technology in organic farming • Organic Certification and Standards • Challenges and market opportunities for organic and low-carbon footprint products	21	4,5,6	3	Lecturing, Brainstorming, group discussions, Field visit, report and presentation	Observation, ask questions and assessing students' answers, quizizz game, report, poster and powerpoint presentation	Classroom
References: 14, 17, 19, 22, 24						
7. Economic, Social Equity and Climate Resilience in Agriculture • Economic viability of sustainable agriculture practices • Market opportunities for sustainably produced foods • Addressing food justice and equity issues in agriculture • Impacts of sustainable agriculture on rural communities • Ethical considerations in food production and consumption	3	2	2	Lecturing, Brainstorming, group discussions	Observation, ask questions and assessing students' answers, quizizz game	Classroom
References: 1, 3, 10, 20, 23						

VII. Evaluation and scoring

1. Matrix to evaluate the output standards of module

Matrix to evaluate the course's outcomes

Course's outcomes	Competence level	Attendance (20%)	Short Report (15%)	Poster Presentation (15%)	Exam (50%)
O1	2	X	X	X	X
O2	2	X	X	X	X
O3	2	X	X	X	X
O4	2	X	X	X	X
O5	2	X	X	X	X
O6	2	X	X	X	X

2. Rubric for course assessment *(Lecturers actively choose the form of assessment - Rubric, assessment criteria and weighten criteria, below are just suggestions.)*

**** Attendance score***

Rubric 1: Attendance assessment

Performance criteria	Weight (%)	Below expected standard <4,0	Lower range of expected standard (4,0-5,4)	Performing satisfactorily at the expected standard (5,5-6,9)	Performing above the expected standard (7,0-8,4)	Exemplary performance (8,5-10)
Attendance/ promptness	30	has a poor attendance/ promptness record.	is frequently tardy and has several absences.	misses no more than the maximum allowed absences according to college policy; is seldom tardy.	has no more than 1 absence; is never tardy.	has perfect attendance; is never tardy.
Level of engagement in class	20	never participates in class discussions; appears apathetic toward class activities.	seldom participates in class discussions.	moderate participation in class discussions; has the answer when called upon; appears interested in	frequently participates in class discussions; often asks thought-provoking questions; appears	frequently participates in class discussions; often asks thought-provoking questions; shows much

				class activities.	enthused about class activities.	effort in going beyond the scope of the required assignments and readings.
Reaction to others/ listening/ respect and tolerance for diverse opinions	10	appears disinterested during class discussions; does not participate by asking questions or contributing any salient points.	somewhat engaged in class discussions; infrequently makes a comment or asks a question to clarify a point.	appears to be listening to class discussions; sometimes makes a comment or asks a question to clarify a point.	is attentive during class discussions; asks obvious questions; contributes own opinion.	is attentive during class discussions; seeks to clarify other's views; shows respect for different opinions; asks appropriate and thoughtful questions.
Level of preparation/ completion of assignments	30	assignments are usually late; assignments usually show no thought ; student is going through the motions to get the work done.	assignments are frequently late; assignments show minimal effort towards completeness or clarity.	usually turns in assignments on time; assignments are only occasionally late. assignments are usually clearly written.	usually turns in assignments on time; no more than 1 late assignment; assignments are always concise, complete, and show critical thinking.	always turns assignments in on time; assignments are always concise, complete, and show critical thinking.
Attitude toward learning	10	shows a lack of desire for learning; contributes nothing to their own learning or that of others.	shows little evidence of desiring to be in the class to learn the material; motive for being in the class is somewhat questionable.	a willing participant in the classroom; exhibits a willingness to learn concepts and course material.	seems interested in learning; makes an above average effort to gain the most out of the learning experience.	exhibits an extremely conscientious and spirited desire to learn the material; enhances the learning of others in the class.

Rubric 2: Report

Evaluation criteria	4 - Above Standard (8,5-10)	3 - Meets Standards (7,0-8,4)	2 - Approaching Standards (4,0-6,9)	1 - Below Standards (<4,0)
Attention Grabber	The introductory paragraph has a strong hook or attention grabber that is appropriate for the audience. This could be a strong statement, a relevant quotation, statistic, or question addressed to the reader.	The introductory paragraph has a hook or attention grabber, but it is weak, rambling or inappropriate for the audience.	The author has an interesting introductory paragraph but the connection to the topic is not clear.	The introductory paragraph is not interesting AND is not relevant to the topic.
Organization of paragraphs	All paragraphs have clear ideas, are supported with examples and have smooth transitions	Most paragraphs have clear ideas, are supported with some examples and have transitions.	Some paragraphs have clear ideas, support from examples may be missing and transitions are weak	Para. lack clear ideas
Accuracy	All supportive facts and statistics are reported accurately.	Almost all supportive facts and statistics are reported accurately.	Most supportive facts and statistics are reported accurately.	Most supportive facts and statistics were inaccurately reported.
Sequencing	Arguments and support are provided in a logical order that makes it easy and interesting to follow the author's train of thought.	Arguments and support are provided in a fairly logical order that makes it reasonably easy to follow the author's train of thought.	A few of the support details or arguments are not in an expected or logical order, distracting the reader and making the essay seem a little confusing.	Many of the support details or arguments are not in an expected or logical order, distracting the reader and making the essay seem very confusing.
Transitions	A variety of thoughtful transitions are used. They clearly show how ideas are connected	Transitions show how ideas are connected, but there is little variety	Some transitions work well, but some connections between ideas are fuzzy.	The transitions between ideas are unclear OR nonexistent.
Closing paragraph	The conclusion is strong and leaves the reader solidly understanding the	The conclusion is recognizable. The author's position is restated within the	The author's position is restated within the closing	There is no conclusion - the paper just ends.

	writer's position. Effective restatement of the position statement begins the closing paragraph.	first two sentences of the closing paragraph.	paragraph, but not near the beginning.	
Sources	All sources used for quotes, statistics and facts are credible, cited and listed in the reference correctly	All sources used for quotes, statistics and facts are credible and most cited and listed in the reference correctly.	Most sources used for quotes, statistics and facts are credible, cited listed in the reference correctlly.	Many sources are suspect (not credible) AND/OR are not cited and listed in the reference correctly.
Grammar & Spelling	Author makes no errors in grammar or spelling that distract the reader from the content.	Author makes 1-2 errors in grammar or spelling that distract the reader from the content.	Author makes 3-4 errors in grammar or spelling that distract the reader from the content.	Author makes more than 4 errors in grammar or spelling that distract the reader from the content.

Rubic 3: Poster presentation

Evaluation criteria	**Above Standard (8,5-10)**	**Meets Standards (7,0-8,4)**	**Approaching Standards (4,0-6,9)**	**Below Standards (<4,0)**
Content - Accuracy	At least 7 accurate facts are displayed on the poster.	5-6 accurate facts are displayed on the poster.	3-4 accurate facts are displayed on the poster.	Less than 3 accurate facts are displayed on the poster.
Graphics - Relevance	All graphics are related to the topic and make it easier to understand. All borrowed graphics have a source citation.	All graphics are related to the topic and most make it easier to understand. All borrowed graphics have a source citation.	All graphics relate to the topic. Most borrowed graphics have a source citation.	Graphics do not relate to the topic OR several borrowed graphics do not have a source citation.
Attractiveness	The poster is exceptionally attractive in terms of design, layout, and neatness.	The poster is attractive in terms of design, layout and neatness.	The poster is acceptably attractive though it may be a bit messy.	The poster is distractingly messy or very poorly designed. It is not attractive.
Grammar	There are no grammatical mistakes on the poster.	There is 1 grammatical mistake on the poster.	There are 2 grammatical mistakes on the poster.	There are more than 2 grammatical mistakes on the poster.

Required Elements	The poster includes all required elements as well as additional information.	All required elements are included on the poster.	All but 1 of the required elements are included on the poster.	Several required elements were missing.

Rubric 4 : Exam

Evaluation criteria	**Above Standard (8,5-10)**	**Meets Standards (7,0-8,4)**	**Approaching Standards (4,0-6,9)**	**Below Standards (<4,0)**
Answer the questions in paper	85 -100% correct answers respectively	70 -84% correct answers respectively	40 -69% correct answers respectively	Below 40% correct answers respectively

VIII. Learning materials

1. Alexandratos, N. and J. Bruinsma (2012). World agriculture towards 2030/2050: the 2012 revision. ESA Working paper No. 12-03. Rome, FAO. https://www.fao.org/3/ap106e/ap106e.pdf
2. Bioversity International (2019) Agrobiodiversity Index Report 2019: Risk and Resilience. Rome (Italy). https://hdl.handle.net/10568/100820
3. Bonfiglioli, A., & Watson, C. (2011, April). Bringing social protection down to earth: Integrating climate resilience and social protection for the most vulnerable. In *Proceedings of the IDS–International Conference:"Social Protection for Social Justice" Institute of Development Studies, East Sussex,* UK (pp. 13-15).
4. CCARDESA. 2023. Climate Smart Agriculture (CSA) Handbook. Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA). https://hdl.handle.net/10568/131582
5. Chartzoulakis, K., & Bertaki, M. (2015). Sustainable water management in agriculture under climate change. *Agriculture and Agricultural Science Procedia*, *4*, 88-98.
6. Das, D., & Baruah, M. (2010). Sustainable practices for pest and disease management of horticultural crops. *Annals of Plant Protection Sciences*, *18*(2), 357-361.
7. FAO (2016) Key to achieving the 2030 Agenda for Sustainable Development. Food Agric 32. http://www.fao.org/3/a-i5499e.pdf
8. FAO. (2019). Sustainable Land Management Sourcebook. Food and Agriculture Organization of the United Nations.
9. Fereres, E., & Connor, D. (2004, November). Sustainable water management in agriculture. In *Challenges of the New Water Policies for the XXI Century:*

Proceedings of the Seminar on Challenges of the New Water Policies for the 21st Century, Valencia, 29-31 October 2002 (Vol. 164). CRC Press.

10. Fisher, E. (2022). Social Equity in Climate-Resilient Agriculture.
11. Francis, C. (2009). Organic Farming: The Ecological System. American Society of Agronomy.
12. HE, H. M., LIU, L. N., Munir, S., Bashir, N. H., Yi, W. A. N. G., Jing, Y. A. N. G., & LI, C. Y. (2019). Crop diversity and pest management in sustainable agriculture. *Journal of Integrative Agriculture*, *18*(9), 1945-1952.

    https://cgspace.cgiar.org/items/51c0fd8a-4481-483d-9dcf-82b6d43d3ec7
13. Jaiswal, D. K., Gawande, S. J., Soumia, P. S., Krishna, R., Vaishnav, A., & Ade, A. B. (2022). Biocontrol strategies: an eco-smart tool for integrated pest and diseases management. *BMC microbiology*, *22*(1), 324.
14. Kristiansen, P., Taji, A., & Reganold, J. (2006). Organic Agriculture – A global Perspective. CABI Publishing.
15. Lal, R. (2015). Soil and Soil Health: Importance and Management Practices. Wiley.
16. Lemaire, G., Franzluebbers, A., Carvalho, P. C. F., Dedieu, B., Feller, C., Høgh-Jensen, H., ... & Oberson, A. (2018). Agroecosystem Diversity. In Agroecosystem Diversity (pp. 1-20). CRC Press.
17. Mason, J. (2003). *Sustainable agriculture*. Landlinks Press. https://www.academia.edu/40766942/SUSTAINABLE_AGRICULTURE_Second_Edition
18. Montgomery, D. R. (2012). Dirt: The erosion of civiliz*ations*. Univ of California press.
19. Nandwani, D. (2016). Organic Farming for Sustainable Agriculture. CRC Press.
20. Resurrección, B. P., Bee, B. A., Dankelman, I., Park, C. M. Y., Haldar, M., & McMullen, C. P. (2019). Gender-transformative climate change adaptation: advancing social equity. *Paper commissioned by the Global Commission on Adaptation (GCA)*.
21. Rockström, J., et al. (2017). Agriculture at a crossroads: global lessons from the Green Revolution. Science, 357(6349), 1230-1231.
22. STEPS Centre. Path Ways to Sustainable Agriculture. A Routledge https://steps-centre.org/wp-content/uploads/2020/11/Pathways-to-Sustainable-Agriculture-Agriculture-and-Food-FINAL-2.0.pdf
23. UN (2015) Transforming our world: The 2030 agenda for sustainable development. https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf
24. Willer & Lernoud (2019): The World of Organic Agriculture. Statistics and Emerging Trends 2019. Research Institute of Organic Agriculture (FiBL) and IFOAM – Organics International http://www.organic-world.net/yearbook/yearbook-2019.html

Additional basic information can be found on the official websites of UN, FAO, IFOAM, etc.

IX. Forms of teaching

Content	Organizational form of the course (lesson)			Total
	Theory	Practice	Self learning	
Introduction to Sustainable and Climate Smart Agriculture	6		10	
Soil Health and Carbon Sequestration	6		10	
Water Management for Climate Resilience	3		10	
Biodiversity Conservation in Agriculture	3		10	
Pest and diseases control	3		10	
Organic Farming and Carbon Footprint Reduction	12	9	30	
Economic, Social Equity and Climate Resilience in Agriculture	3		10	
	36	9	90	

X: Research content orientation of module:

XI. Instructor's requirements for facilities to teach the course:

XII. Date of first approval:

HEAD OF ADVANCED EDUCATION PROGRAM

Ly Thi Thuy Duong

IN CHARGE OF THE COURSE

Truong Thi Anh Tuyet