FACULTY OF POLITICAL SCIENCE AND PUBLIC ADMINISTRATION

CHIANG MAI UNIVERSITY

Bachelor of Science Program
in Sustainability
(International Program)

Faculty of Political Science and Public Administration, Chiang Mai University, focuses on providing quality education, social responsibility, and fairness, aiming to create innovation for global citizenship and serve as a learning model for all learners.

Bachelor of Science Program in Sustainability (International Program)

The Bachelor of Science program in Sustainability is an innovative program that combines liberal arts and scientific knowledge, covering a broad spectrum of disciplines including political science, economics, business administration, geography, humanities, environmental science, engineering, agriculture, and architecture. This multi-disciplinary approach prepares graduates to lead sustainable transformations across environmental, social, and governance (ESG) spheres on both local and international stages. The program enhances analytical thinking, innovative approaches, and entrepreneurial skills that enable graduates to create processes with positive environmental, social, and economic impacts on the operations of public and private organizations. Additionally, graduates gain an understanding of sustainability as it relates to environmental and community issues, informed by a recognition of social and cultural diversity. Graduates are characterized by their open-mindedness, willingness to learn, openness to change, and ability to adapt to the challenges in the 21st century.

Degree and field of study

- Bachelor of Science (Sustainability)
- B.S. (Sustainability)

Job Opportunities

Sustainability Specialist, ESG consultant, officer of policy and planning departments or departments related to sustainable development, administrator officer in domestic and international organizations for strategy and planning department, accountancy department, business sustainability department, entrepreneur for sustainability, academic career path

Curriculum and Degree Structure

       2.1 Total 131 credits for 4 academic years

       2.2 Curriculum Structure

1. General Education Courses		**24**	**Credits**
1.1 Language Literacy		9	Credits
1.2 Digital Literacy		3	Credits
1.3 Global Citizen		3	Credits
1.4 Creativity and Innovation		3	Credits
1.5 Entrepreneurial Skills		3	Credits
1.6 Artificial Intelligence		3	Credits
2. Field of Specialization	A minimum of	**101**	**Credits**
2.1 Foundation		36	Credits
2.2 Major	A minimum of	65	Credits
2.2.1 Requirements		59	Credits
2.2.2 Major Elective	A minimum of	6	Credits
2.3 Minor (if any)	A minimum of	15	Credits
3. Free Electives	A minimum of	**6**	**Credits**

Courses

(1)	General Education			24	Credits
	1.1 Language Literacy			9	Credits
	001207	ENGL 207	English for Effective and Creative Communication 1		3(3-0-6)
	001208	ENGL 208	English for Effective and Creative Communication 2		3(3-0-6)
	001225	ENGL 225	English in Science and Technology Context		3(3-0-6)
	1.2 Digital Literacy			3	Credits
	953111	SE 111	Software for Everyday Life		3(3-0-6)
	1.3 Global Citizen			3	Credits
	140104	PG 104	Citizenship		3(3-0-6)
	1.4 Creativity and Innovation			3	Credits
	201190	SC 190			3(3-0-6)
			Critical Thinking, Problem Solving and Science Communication		
	1.5 Entrepreneurial Skills			3	Credits
	703103	MGMT 103	Introduction to Entrepreneurship and Business		3(3-0-6)
	Artificial Intelligence			3	Credits
	204171	CS 171	Artificial Intelligence Among Us		3(3-0-6)
(2)	Field of Specialization		A minimum of	101	Credits
	2.1 Core Courses			36	Credits
	(Required courses)				
	131101	STB 101	Introduction to Sustainability		3(3-0-6)
	131103	STB 103	Research Design for Sustainability		3(3-0-6)
	131201	STB 201	Sustainability Governance		3(3-0-6)
	131307	STB 307	Understanding Global Trends in Sustainability		3(3-0-6)
	131401	STB 401	Leadership for Sustainable Transformation		3(3-0-6)

154448	GEO 448	Geoinformatics, Environment and Community	3(2-2-5)
208270	STAT 270	Statistics in Social Sciences	3(3-0-6)
213201	ES 201	Principles of Environmental Science	3(3-0-6)
213362	ES 362	Sustainable Municipal Waste Management	3(3-0-6)
253452	ENV 452	Environmental Social and Governance (ESG) Management for Sustainable Business	3(3-0-6)
253458	ENV 458	Life Cycle Assessment and Carbon Footprints of product	3(3-0-6)
751106	ECON 106	Principles of Economics	3(3-0-6)
2.2 Major		**A minimum of**	**65** **Credits**
2.2.1 Requirements			**59** **Credits**
131104	STB 104	Design Thinking for Sustainable Project	2(1-2-3)
131202	STB 202	Social Enterprise for Sustainability	3(3-0-6)
131203	STB 203	Sustainability Standards and Frameworks	3(3-0-6)
131204	STB 204	Sustainable Transformation Management	3(3-0-6)
131205	STB 205	Sustainability Project Development 1	3(2-2-5)
131206	STB 206	Sustainability Project Development 2	3(2-2-5)
131301	STB 301	Analytical Policy on Sustainability	3(3-0-6)
131302	STB 302	Pre-Cooperative and Work Integrated Education	3(3-0-6)
131303	STB 303	Sustainability Project Development 3	3(2-2-5)
131304	STB 304	Cooperative and Work Integrated Education	6
131402	STB 402	Negotiation, Mediation and Conflict Resolution for Sustainability	3(3-0-6)
131403	STB 403	Sustainability Project and Operations1	3(2-2-5)
131404	STB 404	Sustainability Project and Operations2	3(2-2-5)

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154447	GEO 447	Spatial Analysis for Environmental Management and Policy	3(2-2-5)
213371	ES 711	Environmental Remediation Technology	3(3-0-6)
213312	ES 312	Clean Technology and Life Cycle Assessment	3(3-0-6)
213411	ES 411	Environmental, Social and Health Risk and Impact Assessment	3(3-0-6)
751452	ECON 452	Economics of Climate Change	3(3-0-6)
804371	ARCI 371	Sustainable Urban Architecture and Communities	3(3-0-6)

2.2.2 Major Elective A minimum of **6** Credits

- **Major Elective in 300 level** A minimum of **3** Credits

Select at least 1 course from the followings

131306	STB 306	International Cooperation for Development	3(3-0-6)
131308	STB 308	Gender Politics in Development Practice	3(3-0-6)
131311	STB 311	Sustainability in People Management	3(3-0-6)
131312	STB 312	Geopolitics of Sustainable Infrastructure Development in East Asia	3(3-0-6)

- **Major Elective in 400 level** A minimum of **3** Credits

Select at least 1 course from the followings

131405	STB 405	Policy and Governance for Sustainability	3(3-0-6)
131406	STB 406	Stakeholders and Materiality in Sustainability	3(3-0-6)
131407	STB 407	Social Policy and Sustainability in Digital Era	3(3-0-6)
131408	STB 408	Global Trade and Human Rights	3(3-0-6)

131409	STB 409	Employee Engagement	3(3-0-6)
131410	STB 410	Government Relations and Public Affairs	3(3-0-6)
253457	ENV 457	Climate Change Impact and Greenhouse Gas Management	3(3-0-6)
253459	ENV 459	Corporate Greenhouse Gas Assessment and Net Zero Emission Pathway	3(3-0-6)
365429	HANR 429	Greenhouse Gas Management in Forest and Agricultural Sectors	3(3-0-6)

2.3 Minor (if any) A minimum of 15 Credits

Student who wishes to have minor may take courses corresponding to any minor listed in Chiang Mai University announcement about minors being offered for CMU students for at least 15 credits with approval of an academic advisor which lead to addition of at least 15 credits to total

(3) Free Electives A minimum of 6 **Credits**

2.4 Curriculum Structure

Year 1 Semester 1

001207	ENGL 207	English for Effective and Creative Communication 1	3(3-0-6)
131101	STB 101	Introduction to Sustainability	3(3-0-6)
140104	PG 104	Citizenship	3(3-0-6)
208270	STAT 270	Statistics in Social Sciences	3(3-0-6)
751106	ECON 106	Principles of Economics	3(3-0-6)
....	....	Free Elective Course	3
		Total	**18**

Year 1 Semester 2

001208	ENGL 208	English for Effective and Creative Communication 2	3(3-0-6)
131103	STB 103	Research Design for Sustainability	3(3-0-6)
131104	STB 104	Design Thinking for Sustainable Project	2(1-2-3)
201190	SC 190	Critical Thinking, Problem Solving and Science Communication	3(3-0-6)
213201	ES 201	Principles of Environmental Science	3(3-0-6)
253452	ENV 452	Environmental Social and Governance (ESG) Management for Sustainable Business	3(3-0-6)
953111	SE 111	Software for Everyday Life	3(3-0-6)
		Total	**20**

Year 2 Semester 1

001225	ENGL 225	English in Science and Technology Context	3(3-0-6)
131201	STB 201	Sustainability Governance	3(3-0-6)
131204	STB 204	Sustainable Transformation Management	3(3-0-6)
131205	STB 205	Sustainability Project Development 1	3(2-2-5)
204171	CS 171	Artificial Intelligence Among US	3(3-0-6)
213362	ES 362	Sustainable Municipal Waste Management	3(3-0-6)
		Total	**18**

Year 2 Semester 2

131202	STB 202	Social Enterprise for Sustainability	3(3-0-6)
131203	STB 203	Sustainability Standards and Frameworks	3(3-0-6)
131206	STB 206	Sustainability Project Development 2	3(2-2-5)
131307	STB 307	Understanding Global Trends in Sustainability	3(3-0-6)
703103	MGMT 103	Introduction to Entrepreneurship and Business	3(3-0-6)
213312	ES 312	Clean Technology and Life Cycle Assessment	3(3-0-6)
		Total	**18**

Year 3 Semester 1

131301	STB 301	Analytical Policy on Sustainability	3(3-0-6)
131302	STB 302	Pre-Cooperative and Work Integrated Education	3(3-0-6)
131303	STB 303	Sustainability Project Development 3	3(2-2-5)
213371	ES 371	Environmental Remediation Technology	3(3-0-6)
…………	…………	Major Elective in 300 level	3
		Total	**15**

Year 3 Semester 2

131304	STB 304	Cooperative and Work Integrated Education	6
		Total	**6**

Year 4 Semester 1

131402	STB 402	Negotiation, Mediation and Conflict Resolution for Sustainability	3(3-0-6)
131403	STB 403	Sustainability Project and Operations 1	3(2-2-5)
154447	GEO 447	Spatial Analysis for Environmental Management and Policy	3(2-2-5)
751452	ECON 452	Economics of Climate Change	3(3-0-6)
804371	ARCI 371	Sustainable Urban Architecture and Communities	3(3-0-6)
…………	…………	Free Elective Course	3
		Total	**18**

Year 4 Semester 2

131401	STB 401	Leadership for Sustainable Transformation	3(3-0-6)
131404	STB 404	Sustainability Project and Operations 2	3(2-2-5)
154448	GEO 448	Geoinformatics, Environment and Community	3(2-2-5)
213411	ES 411	Environmental, Social and Health Risk and Impact Assessment	3(3-0-6)
253458	ENV 458	Life Cycle Assessment and Carbon Footprints of product	3(3-0-6)
....	....	Major Elective in 400 level	3
		Total	**18**

Course Description

Faculty of Humanities

ENGL 207   :   **English for Effective and Creative Communication 1**

Prerequisite   :   None

Communication in English for developing life skills in the context of intercultural society, which includes reading, reflection, explanation, and oral presentation. Writing on the new media platforms. The developments of communication skills with integrity and credibility. The production of contents in effective and creative ways.

ENGL 208   : **English for Effective and Creative Communication 2**

Prerequisite   :   **ENGL 208 (001208) or consent of the department**

Communication in English for developing professional and academic skills, which includes reading, reflection, explanation, and oral presentation. Writing on the new media platforms The developments of communication skills with integrity. The production of professional and academic contents in effective and creative ways.

ENGL 225   : **English in Science and Technology Context**

Prerequisite   : **001101 or 001102 or e-Pro score of no less than 70**

                                     points; or consent of the department

Communication in English in daily life in science and technology contexts and application of Engligh language skills for careers in science and technology contexts.

Faculty of Political Science and Public Administration

STB 101   : **Introduction to Sustainability**

Prerequisite   : None

Theoretical concepts related to sustainability. Environmental sustainability. Social sustainability. Economic sustainability. Cultural sustainability. Planning and governance for sustainability. The modern sustainability movement. Challenges related to sustainability in the 21st century.

STB 103 : **Research Design for Sustainability**

Prerequisite : STB 101 (131101)

Introduction to research. Types of research: quantitative research, qualitative research, mixed-method research. Procedures and methods for determining sustainability research topic. Guidelines for writing a research proposal. Designing research tools. Data Analysis. Report writing. Research ethics.

STB 104 : **Design Thinking for Sustainability Project**

Prerequisite : STB 101 (131101)

Concepts and theories of Design Thinking. User-centered process. Understanding and identifying sustainability issues. Ideation process for sustainability solutions. Creating and testing sustainability project prototypes

STB 201 : **Sustainability Governance**

Prerequisite : STB 101 (131101)

Introduction to sustainability governance. Significance of global sustainability governance in the 21st century. Concepts and theories in sustainability governance. The role of international organizations in global sustainability governance. Global environmental governance. The role of business sector and civil society in global sustainability governance. Regional integration and global sustainability governance. Impacts of globalization and new technology in global sustainability governance. Trends and challenges in global sustainability governance.

STB 202 : **Social Enterprise for Sustainability**

Prerequisite : STB 101 (131101)

Concepts and theories related to social enterprise. Sustainability and social enterprise. Case study of social enterprises with sustainability impacts at the international level. Case study of social enterprises with sustainability impacts in Thailand. Business model canvas of social enterprise for sustainability. Creating prototypes for a social enterprise. Social enterprise ethics. Social enterprise idea presentation to market.

STB 203 : **Sustainability Standards and Frameworks**

Prerequisite : STB 101 (131101)

Introduction to sustainability standards. Evolution of sustainability standards. Environmental standards. Social standards. Governance standards. Sustainability reporting

frameworks. Challenges in implementing sustainability standards. Future developments in sustainability standards.

STB 204   :   **Sustainable Transformation Management**

Prerequisite   :   **STB 101 (131101)**

Definition and significance of sustainable transformation. Factors and challenges of sustainable transformation. Sustainability frameworks and models. Integrating sustainability into organizational culture. Change management for sustainability. Creating a culture of sustainability. Employee engagement and empowerment. Role of leadership in driving sustainability. Stakeholder engagement and communication. Measuring and evaluating sustainable performance.

STB 205   :   **Sustainability Project Development 1**

Prerequisite   :   **STB 104 (131104)**

Planning and initiating sustainability projects based on concepts and theories related to sustainable development. Designing and defining project scopes and understanding project objectives. Managing stakeholders and resources. Time management and project risk management. Presenting the sustainability project implementation plan.

STB 206   :   **Sustainability Project Development 2**

Prerequisite   :   **STB 205 (131105)**

Project implementation and monitoring. Cost control. Quality assurance. Essential tools and techniques for successful sustainability project delivery. Practical exercises and case studies.

STB 301   :   **Analytical Policy on Sustainability**

Prerequisite   :   **STB 101 (131101)**

Definitions of policy analytics. Big data and policy analysis. Data analytics and policy process. Democratic values and policy analytics. Monitoring policy impacts. Policy advocacy for sustainability.

STB 302   :   **Pre-Cooperative and Work Integrated Education**

Prerequisite   :   **STB 101 (131101)**

Skills for modern organizations in the 21st century. Innovation in modern organizations. Preparing meeting minutes. Report presentation. Writing a resume for employment. Project writing.

Problem analysis. Project logical framework thinking. Principles of SMART Indicators. Project evaluation. Grading will be given on satisfactory or unsatisfactory basis.

STB 303   :   **Sustainability Project Development 3**
Prerequisite   :   **STB 206 (131206)**

Addressing real-world business challenges, learning to align project objectives with broader organizational goals. Enhancing strategic leadership in sustainability projects. Project communication, managing complex stakeholder relationships, and leading project teams effectively. Project control and change management. Project closure, and evaluation.

STB 304   :   **Cooperative and Work Integrated Education**
Prerequisite   :   **STB 302 (131302)**

Cooperative education and integrated work-based learning involve work experience with public sector agencies, private companies, or non-governmental organizations linked to sustainability issues for a minimum of 16 weeks continuously as a staff under the supervision of in-charge trainer(s) of the organizations and instructor(s) of the university. Grading will be given on satisfactory or unsatisfactory basis.

STB 306   :   **International Cooperation for Development**
Prerequisite   :   **STB 101 (131101)**

Introduction to international cooperation for development. Origins of International economic cooperation. Regional economic cooperation. International organizations and sustainable development goals. Trade and monetary cooperation through WTO and IMF. Development cooperation though the World Bank. United Nations and sustainable economic development. Official development assistance for sustainable development. North-South cooperation. South-South cooperation. Inter-institution cooperation for development. Public-private partnership for sustainable development. Success and challenge of international cooperation.

STB 307   **:** **Understanding Global Trends in Sustainability**

Prerequisite   **:** **STB 101 (131101)**

Overview of sustainability. Importance of sustainability. Climate change and sustainability. Biodiversity and resource management. Social responsibility and sustainability. Labor practices and human rights. Corporate governance and sustainability. Ethical leadership. Sustainability reporting frameworks. Sustainability performance metrics. Sustainability investing.Challenges in sustainability implementation. Future trends in sustainability.

STB 308   **:** **Gender Politics in Development Practice**

Prerequisite   **:** **STB 101 (131101)**

Concepts and theories of Patriarchy and Hegemonic Masculinity. Evolution of feminist theories and concepts in development policies and practices. Debates of gender politics in development context. Debates of women's empowerment in development context. Gender and natural resources conservation. Debates of gender-based violence in development context. Gender division of labor and measuring women's work. Gender, participation and governance. LGBTIQA+ movement and activism in transnational context. Debates of sexual reproductive rights and public health. Gender analysis frameworks. Debates of gender mainstreaming include gender strategy, gender-responsive indicator, gender markers, gender budgeting.

STB 311   **:** **Sustainability in People Management**

Prerequisite   **:** **STB 101 (131101)**

People management practices for sustainability. Sustainable recruitment and selection processes. Training and development for sustainability. Performance management and sustainability metrics. Employee Well-being and sustainability. Workplace diversity, equity, and inclusion. Employee engagement and stakeholder collaboration.

STB 312   **:** **Geopolitics of Sustainable Infrastructure**
                                      Development in East Asia

Prerequisite   **:** **STB 101 (131101)**

Theories of international relations and development. Infrastructure and international Politics. The politics of transportation system development in East Asia. The politics of communication system development in East Asia. The politics of energy system development in East Asia. The role of international organizations. Social and cultural impacts. The politics of measuring and evaluating infrastructure development.

STB 401   **: Leadership for Sustainable Transformation**

Prerequisite   : STB 101 (131101)

Cultivating a leadership mindset for sustainability. Concepts and processes of teamwork in organizations. Creative and effective communication and negotiation. Roles and responsibilities of leaders in decision-Making. Analyzing real-life sustainability case studies. Leadership roles in building community networks and collaboration. enhancing leadership effectiveness for change. Implementing strategies for sustainable change.

STB 402   **: Negotiation, Mediation and Conflict Resolution**
                                        for Sustainability

Prerequisite   : STB 101 (131101)

Foundation of conflict and its relationship to sustainability. Impact of globalization on conflict formation. Theories and concepts of conflict: Critical theory, Resource curse theory, Actor-Network Theory (ANT), Institutional theory. Negotiation concepts: distributive negotiation, integrative negotiation, Harvard negotiation model, Best Alternative to a Negotiated Agreement (BATNA). Mediation process design. Conflict resolution and climate change, infrastructure development, resource extraction, forced labor and human trafficking.

STB 403   **: Sustainability Project and Operations 1**

Prerequisite   : STB 303 (131303)

Analyzing stakeholders and clients for sustainability industry project. Stakeholder engagement plan and approaches in sustainability. Due diligence process in sustainability industries. Problem analysis tools including root-cause analysis in sustainability. Applying project management skills to develop project proposals and practice the above course content through participation with establishments related to the sustainability industry.

STB 404   **: Sustainability Project and Operations 2**

Prerequisite   : STB 403 (131403)

Intervention design for project implementation relevant to sustainability. Integrated project planning for sustainability project. Designing project monitoring and reporting system for

sustainability. Data quality for sustainability project. Evaluating sustainability project and practice above topics with clients and stakeholders in sustainability industry.

STB 405   :   **Policy and Governance for Sustainability**
Prerequisite   :   **STB 101 (131101)**

Meanings of policy and governance. Sustainability and policy process. Strategic planning and policy design. Techniques and instruments of policy design. Governance and sustainability. Network, collaboration and governance. Governance for sustainable futures.

STB 406   :   **Stakeholders and Materiality in Sustainability**
Prerequisite   :   **STB 101 (131101)**

Definitions and process of sustainability stakeholder engagement. Sustainability stakeholder analysis. Development of stakeholder canvas and roadmap. Stakeholder analysis techniques and prioritization. Stakeholder management. Sustainability materiality. Sustainability materiality mapping and matrix. Sustainability materiality assessment.

STB 407   :   **Social Policy and Sustainability in Digital Era**
Prerequisite   :   **STB 101 (131101)**

Concepts and theories in social policy. Contexts of social policy in digital era. Welfare rights and sustainability. Digital technology and social policy and sustainability transformation. Policy analytics and social welfare data. Digital innovation and social policy. Case studies of social policy and social innovation. Designing sustainable social innovation in digital era.

STB 408   :   **Global Trade and Human Rights**
Prerequisite   :   **STB 101 (131101)**

Introduction to global governance. Introduction to global economic order. Relationship between international trade promotion and human rights obligations. International institutions in trade. International institutions in human rights protection. Rulemaking in international trade regimes. WTO and the Doha Development Agenda. Positive and negative human rights. Trade and the right to development. Trade and the Right to Health. Trade and environmental protection. Trade and labor rights. Trade and indigenous rights. Trade and human rights accountability. Fair trade. Corporate social responsibility in the United Nations Framework. Case studies on trade and human rights.

STB 409   **:**   **Employee Engagement**

Prerequisite   **:**   **STB 101 (131101)**

       Introduction to employee engagement. Elements and key drivers of employee engagement. Strategies for enhancing employee engagement. Linking employee engagement to organizational outcomes. Designing and implementing employee engagement initiatives. Positive and supportive working environment. Communicating and motivating employees.

STB 410   **:**   **Government Relations and Public Affairs**

Prerequisite   **:**   **STB 101 (131101)**

       Working in government relations. Relations in government and public affairs. Managing communications with stakeholders. The process of managing an organization's image. Supporting public issues. The key issues in the relationship between the government, private organizations, and non-governmental organizations. Approaches to resolving issues related to the relationships between the government, private organizations, and non-governmental organizations

PG 104   **:**   **Citizenship**

Prerequisite   **:**   **None**

       Meanings, definitions, and concepts involving citizenship. Creating awareness in surrounding problems at the local level, national level, and international level. Citizenship and learning, and existence in multicultural society and social diversity. Cultivation of positive attitude for peaceful conflict resolution. Political expression in the 21st century.

Faculty of Social Sciences

GEO 447   **: Spatial Analysis for Environmental Management
                                 and Policy**

Prerequisite   : consent of the department

      Spatial concepts and environment, spatial analysis, principles for linking data with spatial analysis for policy formulation, case studies in spatial analysis in agriculture and natural resources, transportation, logistics, and energy, production and technology, finance and investment, environmental management and communities, stakeholders and participation in environmental policy formulation, spatial approaches for environmental policy and management

GEO 448   **: Geoinformatics, Environment and Community**

Prerequisite   : consent of the department

      Basic principles of geoinformatics for the environment and community, geoinformatics tools, socio-ecological and disaster analysis, spatial data on social and environmental aspects, collecting and compiling spatial community databases, spatial data management, map design and creation, geo communication, disseminating spatial data to communities and the public, geoinformatics projects for the environment and community.

Faculty of Science

SC 190   **: Critical Thinking, Problem Solving and Science
                                   Communication**

Prerequisite   : None

      Critical thinking, problem solving in science and technology, communication in science and technology.

CS 171   **: Artificial Intelligence Among Us**

Prerequisite   : None

      Introduction to artificial intelligence, working framework of artificial intelligence, artificial intelligence in daily life, artificial intelligence in smart home, artificial intelligence in smart city, artificial intelligence in entertainment and multimedia, artificial intelligence in linguistics, artificial intelligence in finance and working life, artificial intelligence in medical service, artificial intelligence in agriculture, trends, influence, and ethical issues of artificial intelligence.

| STAT 270 | : | Statistics in Social Sciences |
| Prerequisite | : | None; for students in humanities and social sciences |

Roles of statistics in social sciences research, describing data with results from statistical package, probability, statistical inference for a single population with results from statistical package, statistical inference for two populations with results from statistical package, analysis of variance with results from statistical package, regression and correlation analysis with results from statistical package, non-parametric analysis with results from statistical package, case studies for applying statistical procedures to social sciences research problems.

| ES 201 | : | Principles of Environmental Science |
| Prerequisite | : | None |

Basic principles of environmental science, natural resources, mass balance calculation, environmental chemistry and biogeochemical cycle, energy and the environment, air, soil, water and groundwater pollution, climate change, human and the environment, introduction to environmental management, current environmental situation

| ES 371 | : | Environmental Remediation Technology |
| Prerequisite | : | 213311 |

Characteristics of environmental contaminants, conceptual site models (CSM) for contaminated environments, legal framework and phased approach for environmental site assessment, risk assessment and safety, sampling methodologies and techniques for contaminated water, soils and groundwater, conventional and innovative remediation methods, containment methods, thermal methods, chemical reaction methods, bioremediation and phytoremediation, design of remediation and restoration systems, case studies.

| ES 312 | : | Clean Technology and Life Cycle Assessment |
| Prerequisite | : | ES 201 (213201) |

Impacts of technology on the environment, concepts of clean technology, moving towards clean technology, application of clean technology in environmental work, hierarchical waste management, life cycle assessment and its environmental impact interpretation, case studies.

| ES 362 | : | Sustainable Municipal Waste Management |
| Prerequisite | : | ES 201 (213201) |

Characteristics, composition and sources of municipal waste, waste collection, minimization and transfer in urban and rural communities, sustainable management of wastes based on 3 R principles and environmental economics, physicochemical and biochemical treatment of municipal wastes, emerging technologies for municipal waste management.

ES 411	:	Environmental, Social and Health Risk and Impact Assessment
Prerequisite	:	fourth year standing

Characteristics and classification of environmental, social, and health risks and impacts, environmental risk and impact assessment processes, consideration of social and health issues in risk and impact assessment, public participation, monitoring, evaluation, and management of risk and impacts, case studies

Faculty of Engineering

ENV 452	:	Environmental Social and Governance (ESG) Management for Sustainable Business
Prerequisite	:	CHEM 162 (203162) and ENV 452 (253101) or consent of the department

Environmental Situation, Environmental Problems and Environmental Policy; Safety management and occupational health; Pollution Prevention and Cleaner Technology; Environmental Law and Standards; Sustainable Development Goals (SDGs); Corporate Sustainable Development Principle based on ESG (Environment, Social, Governance); Sustainability Report; Environmental Management Tool; Circular Economy; Environmental Management System ISO 14001.

ENV 457	:	Climate Change Impact and Greenhouse Gas Management
Prerequisite	:	CHEM 162 (203162) or third year standing or consent of the department

Analysis of Climate Change Impact to Water Resource and Food Production, City and Infrastructure, Health and Wellbeing; Designing of Infrastructure for Climate Change Impact Resilience; Climate Change Policy and Climate Change Act.; Market Mechanism for Greenhouse Gas Management; Overview of Tools for Greenhouse Gas Emission Assessment; Measurement, Reporting and Verification (MRV) System of Greenhouse Gas Reduction; Evaluating the Potential

of greenhouse gas reduction Technologies in Alternative energy, Energy Efficiency, Transport and Waste Management

ENV 458	:	Life Cycle Assessment and Carbon Footprint of Product
Prerequisite	:	CHEM 162 (203162) or third year standing or consent of the department

Introduction and Concept of life cycle thinking and relevant standards, Principal and framework of life cycle assessment, Methodology of life cycle assessment, Life cycle impact assessment and impact interpretation, Applications and case studies, Concept of carbon footprint of product and its applications, Product category rules and data requirements, Flow analysis and data collection, Carbon footprint calculation and case studies, Life cycle assessment analyzing tools**.**

ENV 459	:	Corporate Greenhouse Gas Assessment and Net Zero Emission Pathway
Prerequisite	:	CHEM 162 (203162) or third year standing or consent of the department

Principle of Carbon Footprint for Organization Assessment (CFO); Planning and Boundary Setting; Scoping and Classification of Emission Sources and Sinks; Data Collection and calculation of Greenhouse Gas Emission and Removal Activities; Planning and Setting Greenhouse Gas Reduction Target towards Net Zero Emission Pathway; Greenhouse Gas Mitigation Mechanism; Thailand Voluntary Emission Reduction Program (T-VER); Greenhouse Gas Reduction Projects (Renewable energy or fossil fuel replacement, Improvement of the energy efficiency, Improvement of waste management) Absorption and removal of greenhouse gases from the forestry and agriculture sectors; Nature-based Solutions

Faculty of Agriculture

HANR 429	:	Greenhouse Gas Management in Forest and Agricultural Sectors
Prerequisite	:	365401 or consent of the department

Principle of greenhouse gas management. United Nations Framework Convention on Climate Change (UNFCCC). Protocol and international agreement. Greenhouse gas situation. Greenhouse gas inventory. Greenhouse gas mitigation mechanism and carbon market. Low

emission support scheme. Thailand voluntary emission reduction program (T-VER) in forest and agricultural sectors. T-VER Validation and verification body licensing.

Faculty of Business Administration

MGMT 103	:	Introduction to Entrepreneurship and Business
Prerequisite	:	None

Entrepreneur role in economics development country Entrepreneur and business opportunities. The characteristic of entrepreneur and motivation factors, environment, types of business, forms of business, business plans, principle of management, marketing management, production management, financial management, accounting, taxation, business law, international business and business ethics for entrepreneur.

Faculty of Economics

ECON 106	:	Principles of Economics
Prerequisite	:	None

Basic concepts of microeconomics and macroeconomics. Market structures, demand, supply and equilibrium. Elasticity of demand and supply. Social welfare, market efficiency and microeconomics policies. Economy and national income. Economic growth and aggregated indicators. Monetary and fiscal policies. Open economy and current macroeconomics issues.

ECON 452   :   Economics of Climate Change

Prerequisite   :   751301 for major; or consent of the faculty for

                                  non-major

Global climate change, greenhouse gas emissions, and market failures. Economic tools to control greenhouse gas emissions such as carbon tax, carbon credit market, and measures to promote climate-friendly investment. Multilateral negotiation on climate change. Impact analysis of greenhouse gas reduction measures on international trade, investment, and economic growth.

Faculty of Architecture

ARCI 371   :   **Sustainable Urban Architecture and Communities**

Prerequisite   :   None

History, principles and theories of urban and settlement. Studying and analyzing the shape, figure and ground of urban morphology. The factors of selection of human settlement and city evolution. Concepts and methods of sustainable urbanism relating urban design and planning. Architectural design and city conservation and revitalization methods. Analysis and case studies in housing estate and urban living quality development.

College of Arts, Media and Technology

SE 111   :   **Software for Everyday Life**

Prerequisite   :   None

Roles of software in everyday life. Hardware essentials. Software essentials. Online system essentials. Utility software for modern life. Word processing software. Spread sheet processing software. Presentation software. Image and animation software. Security, ethics and law on computer and internet.

For more details

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