



## Study Plan

**School:** School of Sciences and Technology  
**Degree:** \*\*\* TRANSLATE ME: Pós-Graduação \*\*\*  
**Course:** Sustainable Development in Tropical Regions (cód. 682)

### 1st Year - 1st Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
PAO134100	Sustainability	*** TRANSLATE ME: ***	6	Semester	156
PAO134110	ECOLOGY AND ENVIRONMENTAL PROBLEMS	*** TRANSLATE ME: ***	6	Semester	156
PAO134120	FOOD AND HEALTH IN THE TROPICS	*** TRANSLATE ME: ***	6	Semester	156
PAO134130	AQUACULTURE AND FISHERIES	*** TRANSLATE ME: ***	6	Semester	156
FIT134170	SUSTAINABLE TROPICAL AGRICULTURE	*** TRANSLATE ME: ***	6	Semester	156

### 1st Year - 2nd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
PAO134190	ENERGY, WATER AND WASTES	*** TRANSLATE ME: ***	6	Semester	156
PAO134210	ETHICS, CONSERVATION AND HERITAGE	*** TRANSLATE ME: ***	6	Semester	156
PAO134230	HERITAGE AND TOURISM IN SÃO TOMÉ E PRÍNCIPE	*** TRANSLATE ME: ***	6	Semester	156
ECN134240	DEVELOPMENT PROBLEMATIC	*** TRANSLATE ME: ***	6	Semester	156
PAO134250	SEMINAR ON SUSTAINABILITY	*** TRANSLATE ME: ***	6	Semester	156

### Conditions for obtaining the Degree:

\*\*\* TRANSLATE ME: Para aprovação na componente curricular é necessário a aprovação (através de avaliação ou creditação) das seguintes unidades curriculares: {\ }newline

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1º Semestre: {\ }newline

6 UC obrigatórias num total de 30 Ects

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2º Semestre:

6 UC obrigatórias num total de 30 Ects

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### **Sustainability (PAO134100)**

Sustainability and Sustainable development – concepts, ideas and mark

Sustainability: environmental, social, economic, political

Environmental problems: development, environment and nature, ecological footprint

Social issues: governance, representativeness, administration-citizen distance, employment, poverty, inequalities

Agenda 2030 for Sustainable Development of UN. Problems in tropical countries and the UN programs

Population and development: human population history– periods, transitions.

Population explosions and implosions; demographic transitions; cultural stages, values, vital rates; pro- and anti-natalist mentalities; development level, gender issues, and fertility

Human rights. Indexes of well-being and happiness

Sustainable development issues in tropical developing countries

Models of society and of development. Global and local. Visions of future, utopias and dystopias. The role of the elites

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### **ECOLOGY AND ENVIRONMENTAL PROBLEMS (PAO134110)**

Ecology - processes at global and local scales. Patterns and processes; organization and chaos; permanence and transformation; interactions, autonomy and dependence. Regulation and equilibrium. Matter and energy. Organisms and environmental factors. Production and decomposition. Populations and their interactions. Communities, structure. Ecological succession.

The holistic and integrated approach. From science to ideology

Environmental quality. The state of the environment in the various regions of the planet. The environment and development since WW II; environmental legislation.

Ecological footprint. Societies, consumption, use of resources and production of waste. Product life cycle; the Rs and recycle, downcycle and upcycle

Natural resources and management

Habitats and biodiversity loss

Climate change: scenarios, impacts on the environment and economy, adaptation strategies; carbon and its market

Environmental problems in the tropics. UN programs on forest management and climate

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### **FOOD AND HEALTH IN THE TROPICS (PAO134120)**

Food: local resources, potentialities and limitations. Nutritional requirements and how to supply them with local resources: energy, carbohydrates, lipids, minerals and vitamins. Nutritional requirements according to age, gender and level of activity. Elaboration of a balanced and healthy diet. Nutritional deficiencies, physical and cognitive development. Food safety.

Health: environment and health, public health - health problems in the tropics, hygiene and health. Environmental quality and health. Traditional medicine vs. conventional medicine. Major health problems in the tropics - malaria, neglected tropical diseases, tuberculosis, HIV-AIDS. Pathways of disease transmission. Nutritional deficiencies, physical development and health.

Education for health



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### **AQUACULTURE AND FISHERIES (PAO134130)**

Aquaculture in the tropics. Ecology of the aquatic ecosystem. Water quality parameters and environmental impacts. Target species. Production systems and engineering. Nutrition and Feeding. Animal growth and reproduction. Opportunities for aquaculture.

Integrated agro-aquaculture production systems. Aquaponics. Problems and potentialities. Case studies in tropical regions.

Local fishing resources and their exploitation - main species; the importance of sustainable management of natural resources. Local fishing methods and fishing yield; the importance of traditional and small-scale fisheries; fleet, increase of fishing yield. Processing and preservation of fishery products.

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### **SUSTAINABLE TROPICAL AGRICULTURE (FIT134170)**

The sustainability concept applied to Agriculture, with the focus on tropical environments: Natural resources and socio-economic conditions. Potential and limitations in the primary sector.

Cropping systems in subsistence agriculture and possibilities for alternative cash-crops.

The challenges for low input agricultural systems in tropical environments:

- Soil conservation and soil fertility;
- Efficient water use;
- Crop selection and its combination/rotation;
- Weed, pest and disease control;
- Management of crop residues for livestock and soil conservation.

Post-harvest and agroindustry:

- Conservation and storage of agricultural products;
- Transformation of agricultural products;
- Markets;
- Value chains of crops.

Agricultural systems in the tropics:

- Family agriculture;
- Urban and peri-urban agriculture;
- Commercial agriculture.

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### **ENERGY, WATER AND WASTES (PAO134190)**

Energy: Sources, power plants and environmental impacts. Energy demand. Hydroelectricity, thermal power plants, solar thermal SWH and photovoltaic energy, small and medium scale solutions and distributed production, biomass and the importance of reducing the wood consumption.

Water: Sources and uses. Water characterization and quality. Main water treatment processes and operations. Stages of water treatment. Water storage and distribution.

Wastewater: Water pollutants. Sources, fate and pollutants impact in the aquatic environment. Wastewater types and characterization. Main wastewater treatment processes and operations. Stages of wastewater treatment and low-maintenance, cost-effective solutions suited for the tropics. Wastewater reclamation and reuse. Sludge treatment, reuse and disposal.

Solid wastes: the domestic waste composition, the decomposition process of organic wastes and environmental risks; waste management; separation, composting; landfills.



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## **ETHICS, CONSERVATION AND HERITAGE (PAO134210)**

Nature, ethics and conservation

Relationship between humans and nature

Nature - From life support to the spiritual dimension

Nature importance. Biophilia. Nature and ideology.

Eco-ethics, environmental ethics, Animal ethics. Deep Ecology, Biospheric egalitarianism

Environmental activism. Environmental education: theory and praxis: case-studies.

Nature conservation – ecosystems and biodiversity. Protected areas, parks, reserves, natural monuments, landscapes, habitats.

IUCN and UNESCO classifications.

Tropical ecosystems - fragilities, values, conservation policies and priorities

Landscape, heritage and tourism

Landscape – Concepts; evolution and actuality.

Heritage – Concepts; evolution and actuality.

Tourism – Concepts; evolution and actuality.

Relation between the covered concepts: evolution, sustainability and future; Case-studies

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## **HERITAGE AND TOURISM IN SÃO TOMÉ E PRÍNCIPE (PAO134230)**

1. Conservation

1.1. Biodiversity: endemic & native species; Conservation: current state, evolution and future prospects; STP Natural Parks

1.2. Legislative framework, education and activism: principles and practices

1.3. Conservation and Heritage - connection, evolution and sustainability

2. Heritage

2.1. Material and immaterial; classified and unclassified; natural and historic; preservation and sustainability; evolution, actuality and legislation

2.2. Heritage resources and cultural events

2.3. Heritage and Tourism - connection, evolution and sustainability

3. Tourism

3.1. Main axes of the 2018 National Strategy: sun and sea, culture and heritage, nature; resources and stakeholders; training and professionalism; inclusion and employment; communication; preservation, evolution and actuality

3.2. Tourism as a driver for sustainable growth

3.3. Tourism and Conservation - connection, evolution and sustainability

4. Cross-Sectional Case Studies

Biodiversity; Plantations; beaches, etc.



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### **DEVELOPMENT PROBLEMATIC (ECN134240)**

Sustainability and development - problems and opportunities: sustainable development (from the perspective of the economy, opportunities and fragilities; territory, economic activities and levels of self-sufficiency; the problems of development and the economic integration of small countries and islands into the African and global framework

Water, soil and energy resources: the economic management of basic resources for sd

Natural ecosystems and agroforestry and fisheries systems: the economic management of complex resources for sd

Landscape and Identity: nature, culture and heritage; weaknesses and potentialities; development strategies. Development in the tropics and in islands

Tourism and development: potentialities and risks; evolution and future, trends and alternatives

Sustainable cities: the problems of urban growth in developing countries; development vs growth; evolution and future; the landscape in urban planning; concepts and trends

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### **SEMINAR ON SUSTAINABILITY (PAO134250)**

Science: knowledge and questioning; the search for patterns; causal relationships; science, belief, ideology; the need for rigor and repeatability, the practice and limitations of science. The multidisciplinary perspective, potentialities and practical weaknesses.

Research methods: quantitative and qualitative methods; stages in carrying out research work; questionnaires, content analysis. Basic statistics - regressions, correlations, comparisons, trends. Mixed Methods.

Communication: oral presentation techniques, writing (papers, reports, posters, proposals); use of softwares.

Preparation, presentation and discussion of a project proposal by the students on a theme related to sustainability, including a justification and the objectives to be achieved, the state of the art, the phases and the methods to achieve the intended objectives, and required funds.

In each edition, several talks by professors or external elements on the proposals' subjects will contribute to their consistency