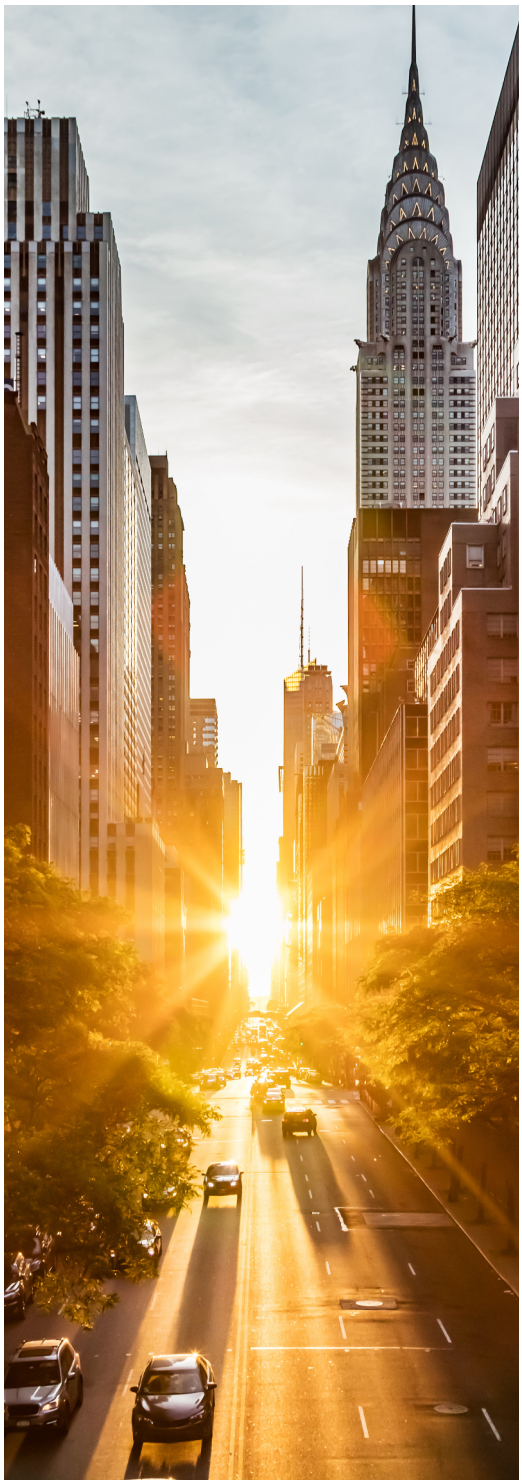

Cert.ESA

Certificate in Ecosystem Accounting

Syllabus and study guide 2023 – 2024

Designed to help with planning study and to provide detailed information on what could be assessed in any examination session.

Content

Course description

The aim of the syllabus is to introduce students to the subject of ecosystem accounting and provide core knowledge of the underlying principles and major technical areas of this new and emerging accounting branch.

The course acquaints the student with the rationale behind and the functions of ecosystem accounting. The syllabus then considers the separate components an ecosystem accountant should have detailed knowledge of, such as ecosystem extent, -condition, -services and -assets.

After completion the student should be able to value ecosystem assets in monetary terms and ecosystem services in physical & monetary terms, explain the basis of their calculations, compute basic ecosystem accounts, and be able to discuss environmental themes in relation to businesses and public sector companies.

Learning outcomes

On successful completion of this exam, students should be able to:

- Discuss the framework for ecosystem assessments.
- Explain and compute ecosystem services in physical and monetary terms.
- Explain and compute ecosystem assets in monetary terms.
- Discuss the valuation of ecosystem assets in monetary terms.
- Discuss the valuation of ecosystem services in physical & monetary terms.
- Discuss of ecosystems extent accounts and ecosystem extent data.
- Discuss considerations of ecosystem condition and the applications of ecosystem condition accounts.
- Demonstrate knowledge of integrated and extended accounting for ecosystem services and assets.
- Prepare basic ecosystem .
- Demonstrate knowledge of complementary approaches to valuation.
- Demonstrate knowledge of accounting for specific environmental themes.

Assessment structure

This is a two-half-hour computer-based examination of 321 marks (70% pass mark), comprising 5 sections, based on material drawn from across the syllabus. The examination will assess theoretical knowledge and practical competency. Some questions will adopt a scenario/case study approach.

Candidates will be expected to demonstrate that they can apply their understanding to a range of practical scenarios.

The examination will comprise:

SECTION A: 15 theoretical questions, each valued at 3 marks

SECTION B: 7 theoretical questions, each valued at 3 marks
SECTION B: 8 practical questions, each valued at 6 marks

SECTION C: 7 theoretical questions, each valued at 3 marks
SECTION C: 8 practical questions, each valued at 6 marks

SECTION D: 7 theoretical questions, each valued at 3 marks
SECTION D: 8 practical questions, each valued at 6 marks

SECTION E: 7 theoretical questions, each valued at 3 marks
SECTION E: 8 practical questions, each valued at 6 marks

Syllabus

SECTION A: Introduction and overview

1. Introduction to environmental-economics
2. Principles of ecosystem accounting

SECTION B: Accounting for ecosystem extent and condition

1. Spatial units for ecosystem accounting
2. Accounting for ecosystem extent
3. Accounting for ecosystem condition

SECTION C: Accounting for ecosystem services

1. Ecosystem services concepts for accounting
2. Accounting for ecosystem services in physical terms

SECTION D: Monetary valuation and integrated accounting for ecosystem services and assets

1. Principles of monetary valuation for ecosystem accounting
2. Accounting for ecosystem services in monetary terms
3. Accounting for ecosystem assets in monetary terms
4. Integrated and extended accounting for ecosystem services and assets

SECTION E: Applications and extensions of SEEA EA

1. Complementary approaches to valuation
2. Accounting for specific environmental themes
3. Indicators and combined presentations

Detailed study guide

SECTION A: Introduction and overview

Introduction to environmental-economics

- Explain to context for SEEA Ecosystem Accounting.
- Explain what SEEA Ecosystem Accounting is.
- Discuss the statistical context for ecosystem accounting.
- Discuss the conceptual approach of the SEEA Ecosystem Accounting:
  - Connections to other measurement frameworks and initiatives.
  - Connection to the SEEA Central Framework.
  - Connection to the System of National Accounts.
  - Connections to other statistical methodology documents and guidance.
  - Relationship to other global environmental measurement and assessment initiatives.
- Describe the role of national statistical offices and other agencies.
- Describe the ecosystem accounting compilation approaches.
- Describe the structure of the SEEA EA.

Principles of ecosystem accounting

- Discuss the overview of the ecosystem accounting framework:
  - Measurement perspectives on ecosystems.
  - The logic of the ecosystem accounting framework.
  - Ecological and economic considerations concerning the ecosystem accounting framework.
- Explain the set of ecosystem accounts.
- Explain the framing of values in ecosystem accounting.
- Discuss General National Accounting Principles:
  - Length of the accounting period and frequency of accounts.
  - Time of recording.
  - Units of measurement.
  - Gross and net recording.
  - Scale of application.
  - Data quality and scientific accreditation.
  - Uncertainty in measurement.

SECTION B: Accounting for ecosystem extent and condition

Spatial units for ecosystem accounting

- Apply types of spatial units:
  - Ecosystem assets.
  - Applying the conceptual boundary for ecosystem assets.
  - Ecosystem accounting areas.
- Delineate ecosystem asset:
  - General principles.
  - Approaches to identifying specific features.
- Classify ecosystem assets:
  - General principles.
  - SEEA Ecosystem Type reference classification.
- Demonstrate considerations in the delineation of spatial units:
  - Delineation of ecosystem assets in practice.
  - The use of data on the characteristics of land.
  - Organising data about socio-economic and other characteristics.

Accounting for ecosystem extent

- Explain the purpose in accounting for ecosystem extent.
- Discuss ecosystem extent accounts:
  - Scope of extent accounts.
  - Structure of extent accounts and accounting entries.
  - Recording ecosystem conversions.

- Apply complementary presentations of ecosystem extent data:
  - Mapping ecosystem extent.
  - Ecosystem type change matrix.
  - Extent accounts for linear features and subsurface ecosystems.
  - Linking extent accounts and economic data.

Accounting for ecosystem condition

- Define and select characteristics and variables of ecosystem condition:
  - Ecosystem condition characteristics.
  - Ecosystem condition typology.
  - Ecosystem condition variables and their selection.
  - Ecosystem condition variable account.
- Discuss ecosystem condition indicators:
  - Deriving ecosystem condition indicators from variables.
  - Reference levels and conditions.
  - Ecosystem condition indicator account.
- Apply aggregate measures of ecosystem condition:
  - Ecosystem condition indices.
  - Potential aggregation functions and weights.
  - Presentation of ecosystem condition indices.
- Discuss considerations in the measurement of ecosystem condition:
  - Variables for selected ecosystem types.
  - The use of data on environmental pressures.
  - The role of biodiversity in ecosystem condition accounts.
  - Accounting for ecosystem conversions.
  - Relationship between ecosystem condition, ecosystem capacity and ecosystem degradation.
- Applications of ecosystem condition accounts.

SECTION C: Accounting for ecosystem services

Ecosystem services concepts for accounting

- Explain the purpose in accounting for ecosystem services.
- Discuss various concepts and principles in accounting for ecosystem services:
  - Ecosystem services.
  - Benefits.
  - Final and intermediate services.
  - Users and beneficiaries.
  - Abiotic flows.
  - Identifying flows of ecosystem services.
- Apply the reference list of selected ecosystem services:
  - Principles of the reference list of selected ecosystem services.
  - The link between biodiversity and ecosystem services.
  - The treatment of non-use values.
  - The treatment of ecosystem disservices.
- Demonstrate treatment of specific ecosystem services and other environmental flows:
  - The treatment of biomass provisioning services.
  - The treatment of water supply.
  - The measurement of global climate regulation services.
  - The identification of cultural services.
  - The treatment of abiotic and other environmental flows.
- Analyse ecosystem capacity:
  - Defining ecosystem capacity for accounting purposes.
  - Defining ecosystem capacity with respect to specific types of ecosystem services.

Accounting for ecosystem services in physical terms

- Apply ecosystem services flow accounts in physical terms:
  - Overall structure of the ecosystem services flow accounts.
  - Applying general supply and use principles in ecosystem accounting.
  - Ecosystem services and benefits.
  - Recording intermediate services.
  - Recording abiotic flows.
  - Exports and imports of ecosystem services.
  - Recording cultural services.
  - Linking the supply of ecosystem services to economic units.
- Identify considerations in accounting for ecosystem services in physical terms:
  - Spatial allocation of ecosystem services supply and use.
  - Determining ecosystem service measurement baselines.

SECTION D: Monetary valuation and integrated accounting for ecosystem services and assets

Principles of monetary valuation for ecosystem accounting

- Discuss purpose and focus of monetary valuation for ecosystem accounting:
  - The purposes for monetary valuation in ecosystem accounting.
  - The focus of monetary valuation for ecosystem accounting.
- Discuss valuation concepts and principles for accounting:
  - Exchange values and market price concepts in national accounting.
  - Monetary valuation of ecosystem services.
  - Monetary valuation of ecosystem assets.
  - Volume and price measures.

Accounting for ecosystem services in monetary terms

- Discuss ecosystem services flow account in monetary terms.
- Discuss techniques for valuing transactions in ecosystem services:
  - Methods where the prices are directly observable.
  - Methods where the prices are obtained from markets for similar goods and services.
  - Methods where the prices (and associated values) are embodied in market transactions.
  - Methods where the prices are based on revealed expenditures in related goods and services.
  - Methods where the prices are based on expected expenditures or markets.
  - Other valuation methods.
- Apply valuation methods for different ecosystem services:
  - Valuation of different types of services.
- Discuss spatial variation in values and value transfer for the purpose of ecosystem accounting:
  - Methods for incorporating spatial variation in prices.

Accounting for ecosystem assets in monetary terms

- Discuss the monetary ecosystem asset account:
  - Structure of the monetary ecosystem asset account.
  - Ecosystem enhancement.
  - Ecosystem degradation.
  - Ecosystem conversions.
  - Other changes in the volume of ecosystem assets.
- Distinguish approaches to valuing ecosystem assets:
  - General approach to valuing ecosystem assets.
  - Scope and definition of returns.
  - Valuation of returns.
  - Future flows of services in physical terms.
  - Asset lives.
  - Expected institutional arrangements.
  - Discounting.
  - Measuring changes in the net present value of ecosystem assets over an accounting period.

Integrated and extended accounting for ecosystem services and assets

- Explain extended supply and use tables.
- Explain extended balance sheets:
  - Structure of an extended balance sheet.
  - Aligning ecosystem asset values with the values of SNA assets.
- Discuss assigning economic ownership and allocation of degradation and enhancement:
  - Considerations in assigning economic ownership
  - The institutional sector for ecosystem assets.
  - Allocation of degradation and enhancement to economic units.
- Discuss integrated sequence of institutional sector accounts:
  - Structure of the extended sequence of accounts.
  - Adjusted income aggregates.

SECTION E: Applications and extensions of SEEA EA

Complementary approaches to valuation

- Build connections with welfare values:
  - Bridge table between accounting and welfare values.
  - Assessing externalities, ecosystem disservices and health outcomes.
- Discuss alternative measures of income, wealth and degradation:
  - Restoration cost-based approaches to measuring degradation.
  - Polluter pays presentation of degradation.
  - Defensive expenditures.
  - Alternative measures of environmental income.
  - Alternative approaches to asset valuation.
  - Extended modelling/greened economy modelling.
- Analyse corporate natural capital assessments.

Accounting for specific environmental themes (thematic accounting)

- Discuss general principles of thematic accounting.
- Discuss accounting for biodiversity:
  - Biodiversity assessments and the SEEA EA.
  - Accounting for species.
  - Accounting for habitats and spatial scale.
  - Accounting for the genetic level of biodiversity.
  - Using accounting data to support decision making on biodiversity.
- Demonstrate accounting for climate change:
  - Applying the SEEA EA to inform climate policies.
  - Accounting for carbon.
  - Other climate change related accounts and indicators.
- Demonstrate accounting for the ocean:
  - A set of ocean accounts.
  - Indicators derived from ocean accounts.
- Demonstrate accounting for urban areas:
  - A set of urban ecosystem accounts.
  - Potential indicators for urban ecosystems.

Indicators and combined presentations

- Identify indicators derived from the SEEA EA:
  - Roles and functions of SEEA EA indicators.
  - Indicators from the ecosystem accounts.
  - Indicators from thematic accounts.
- Apply indicator frameworks and the SEEA EA:
  - SEEA EA and global indicator monitoring frameworks.
  - Other indicators and applications.
- Develop combined presentations for ecosystem accounting:
  - Information on environmental activities.
  - Economic dependence on ecosystems.
  - Information on policy instruments.
  - Using the DPSIR framework.

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