



Diploma Supplement

to the Massive Open Online Course (MOOC)

‘Beyond the Visible – Imaging Spectroscopy for Agricultural Applications’

This Diploma Supplement follows the model developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international ‘transparency’ and fair academic and professional recognition of qualifications (diplomas, degrees, certificates etc.). It is designed to provide a description of the nature, level, context, content, and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgments, equivalence statements or suggestions about recognition.

1 Information Identifying The Qualification

1.1 Name of qualification and (if applicable) title conferred (in original language):

Not applicable

1.2 Main field(s) of study for the qualification:

Hyperspectral Remote Sensing in the context of agricultural applications

1.3 Language(s) of instruction:

English

2 Information On The Level Of The Qualification

2.1 Level of qualification:

Level 2 of the European Qualifications Framework

2.2 Official length of program:

The average study time for the entire online course is estimated with two to four hours

2.3 Access requirements(s):

Basic understanding of hyperspectral remote sensing principles (participants need to pass a pre-assessment to access the main content of the course)

3 Information On The Contents And Results Gained

3.1 Mode of study:

Massive Open Online Course (self-paced and automatically evaluated online learning)

3.2 Program requirements:

None

3.3 Program details: (e.g. modules or units studied), and the individual grades/marks/credits obtained:

The Massive Open Online Course (MOOC) 'Beyond the Visible – Imaging Spectroscopy for Agricultural Applications' explains the benefits of hyperspectral over other types of remote sensing data, including the challenges and opportunities **in the field of agriculture**. The course introduces imaging spectroscopy of vegetation with a focus on vegetation trait mapping and agricultural applications. Furthermore, the MOOC provides an overview of methodological considerations and data processing in the context of agricultural applications as well as an introduction to the EnMAP-Box software including hands-on experience through tutorials.

The course is open for everybody who wants to start working with hyperspectral (imaging) data or has an interest in understanding how this unique technology can be utilized to understand and monitor agricultural processes.

The course consists of three consecutive lessons, whereas each lesson builds on the knowledge acquired in the previous one. It covers the following topics:

- Introduction to imaging spectroscopy for agricultural applications including the principles of imaging spectroscopy of vegetation, an introduction of vegetation traits that can be mapped from hyperspectral imagery and an overview of reference data collection on the ground
- Methodological aspects including data and software resources and overviews of methods and workflows
- Hands-on training on hyperspectral data and software using the EnMAP Box Agricultural Apps

The content of **BEYOND THE VISIBLE – IMAGING SPECTROSCOPY FOR AGRICULTURAL APPLICATIONS**

Lesson 1: Introduction to Imaging Spectroscopy for Agricultural Applications	
Topic 1: Imaging Spectroscopy of Vegetation	Topic 2: Biophysical and Biochemical Variables
Topic 3: Ground Reference Data Acquisition	

Lesson 2: Methodological Aspects	
Topic 1: Data and Software Resources	Topic 2: Methods
Topic 3: Workflow	

Lesson 3: Hands-On Training	
Topic 1: Introduction to the EnMAP Box	Topic 2: EnMAP Box Agricultural Apps
Topic 3: Discussion of Accuracy and Limitations	

In total, 'Beyond the Visible' includes 17 Videos, 2 Interactive Graphics, 6 Tutorials and 12 Quizzes plus one Final Exam.

	Videos	Interactive Graphics	Tutorials	Quizzes
Welcome	2			
Thematic lesson 1	4	1		4
Thematic lesson 2	4	1		4
Thematic lesson 3	7		6	4
	17		6	12 + Final Quiz

3.4 Grading scheme and, if available, grade distribution guidance:

Performance is graded in the form of quizzes. The following quiz types are incorporated:

- Single choice
- Multiple choice
- Free choice
- Sorting choice
- Fill in the blank

The following parameters are set for the quizzes:

- Topic quizzes (9): 24 questions in total
 - No requirements
- Lesson quizzes (3): 10 questions each
 - Passing Score: 50%
 - Number of quiz retakes: Unlimited
 - Time Limit: None
- Final exam quiz (1): 15 questions
 - Passing Score: 70%
 - Number of quiz retakes: Unlimited
 - Time Limit: None

Total number of questions: 49

3.5 Overall classification of the qualification (in original language):

Certificate is granted based on passed/not passed grading.

4 Information On The Function Of The Qualification

4.1 Access to further study:

Not applicable

4.2 Professional status (if applicable):

Not applicable

5 Additional Information

5.1 Additional information:

For further information, please refer to the EO-College website:

<https://eo-college.org/courses/beyond-the-visible-imaging-spectroscopy-for-agricultural-applications/>