Co-funded by the
Erasmus+ Programme
of the European Union

Overall Course evaluation report by pilot students

Course: SDI-T for environmental change monitoring

Executive Summary

This document presents briefly a synthesis of the evaluation questionnaires submitted by EMME Course 20: **SDI-T for environmental change monitoring** pilot students.

The piloting phase of EMME Courses took place from March 2020 to September 2020, a seven-week time period for students to follow the syllabus, study the materials, and deliver all the exercises/projects of the course. Pilots ran in parallel for each course independently, and four students enrolled in each course (12 total) coming from all partnership Middle East Universities. The objective of the pilots was to assess course contents and effectiveness and to gain insights depending on the performance of students regarding the course complexity and workload. The evaluation questionnaire given to pilot students upon completion of the course consists of twelve questions. The questionnaire is common to all courses.

Process

After giving a brief synopsis of the Course aim and objectives, pilot students were asked to answer the evaluation questionnaire. This adopts a mixture of closed and open-ended questions in an attempt to provide course developers with insights on the course outline, content, quality, and effectiveness. Most closed-ended questions however, have an open-ended part that accompanies them, where students are asked to comment on their choices. Questions 5 and 7 are in reality follow-up questions to questions 4 and 6 respectively. Question 12 constitutes overall summative course evaluation of the course by the pilot students. The list of questions is the following:

1. Do you think that the aim, as described above, has been reached well in this course?
2. How was the workload of the course?
3. How do you grade the course as a whole?
4. Mark the strongest weeks of the course
5. Why these weeks are strongest?
6. Mark the weakest weeks the course
7. Why these weeks are most weak?
8. Which parts of the course do you recommend to omit?
9. What parts of the course do you recommend to add?
10. How was your background knowledge to this course? Was the course too easy or too complicated for your knowledge?
11. Grade the quality of contacts with lectures
12. How do you evaluate the course?

Results

Four pilot students from Middle East Universities enrolled to the SDI-T for environmental change monitoring Course. All students have completed the Course on time. In what follows, a brief synopsis of the pilot students' answers to the questionnaire is presented.

When questioned whether the course reached its aim (Question 1), pilot students' answers are half-split between 4 and 5 (yes, completely) on the rating scale, showing positive reception of the course on behalf of the pilot students. Commenting on and justifying their answers three of them said that they learned how to assess environmental change through this course. Moreover, one answered, that while the course achieved its aims, it seemed that the course content for a couple of weeks is not what one would expect and another one mentioned that some parts of the course were not that well explained.

Regarding course overload (Question 2), three out of the total four answers rated overload as fair (option 3), while one pilot student rates as high (option5). Hence, we can state that for at least one of the pilot students, the course seemed to have heavy workload especially due to the fact that he/she had to communicate with teachers for more clarifications and course material. What is clear is that none of the pilot students assessed course workload as falling on the left side of the rating scale, meaning that no one found course workload to be less than fair. This finding enables us to say that the course is robust and serves both undergraduate and postgraduate levels.

Overall assessment of the course quality and content (Question 3) reached the highest score (very good) among three students, while the fourth rated as "good". One student fount the course to be "purposeful and coherent", another described it as "excellent". Most students agree that they learned a lot about the software needed to complete the course exercises and that teachers explained the course content adequately, demonstrating that both theoretical and practical parts of the course intertwined with each other to form a coherent course in terms of content, quantity, quality, and complexity when needed.

Questions 4 and 6 concerning strongest and weakest weeks of the course respectively reveal an antithesis among students. Although three students mention weeks 4 and 5 to be the strongest, the fourth rates these as the weakest ones. Those who think they are the strongest, they explain (Question 5) that weeks 4 and 5 cover and address the different environmental change topics followed with the use of different kinds data and software and that the exercises are all about applying knowledge gained in previous weeks to real environmental change problems. The one who finds them the weakest, justifies it (Question 7) by mentioning problems with data availability for completing the exercises, hectic communication with the assigned teachers, and lack of detailed explanation and guidelines on performing the tasks required by students. It is interesting however, that in Question 7, two students could not characterise any week of the course as weak saying that all parts of the course provide "useful and practical training in different fields" and that "each week was in a purposeful framework", meanwhile the third said that week 3 is the weakest referring issues with the installation and use of the software needed for the week's exercises.

When asked what parts of the course could be omitted (Question 8), one student said nothing, three answered that they would omit module 2.4 (Import non-spatial data and join with spatial datasets - (Simple) SQL queries. All three agree that the explanations provided are not as exhaustive as they should be and reported issues with the guidelines for installing the applications needed for the exercise.

On the other hand, when asked what they would add to the course (Question 9), two pilot students would not add a thing since they find the course "complete and comprehensive", one said they would add more theoretical and practical parts related to image processing to remote sensing modules (week 3), and finally the fourth would like the course to include more applications related to groundwater and water pollution.

Regarding Question 10, on students' background knowledge, how and if the course met it, students' replies suggest that they gained further knowledge especially regarding software they had to use especially for this course; PgAdmin and other SQL applications (all pertaining to section 2.4, which seems to be the most difficult for pilot students). Other applications and software such as SNAP and QGIS seem much more friendly to students since they became more familiar with them and gained good experiences and expanded their expertise with different GIS software to use in their regular practice.

As it concerns communication and contacts between course teachers and students (Question 11) all students have rated it as good (option 4), indicating overall good collaboration. Most teachers managed to answer to students' questions, to guide them through the course, and to grade their works effectively and on time throughout the piloting phase. Also, all students focused on the good quality of the presentations and overall course material but some more information seems to be necessary (such as detailed tutorials for executing the exercises or guidelines on installing software).

Finally, through Question 12 students are asked to evaluate the course as a whole. Difficulties and misunderstandings have undoubtedly emerged in the pilot process, especially since the course is quite intensive. In

this sense, the gradual complexity of the course contents, materials, and tasks during the seven-week period is justified. There is consensus among students on the quality of content provided to them.

Weeks 1, 2, and 3 have evolved smoothly for all four students. An exception appears to be module 2.4, since none of them was familiar with PgAdmin or PostgreSQL software, thus this module imposed many difficulties to students and has been the reason of late delivery of the corresponding exercise. However, they all highlight the fact that they gained knowledge on a subject that they had limited or even zero experience with. They also stated that in order to avoid complications related to that module, the exercise should have been more thoroughly explained.

Weeks 4 and 5 which appear to be more demanding in terms of workload, have also progressed smoothly and overall reception by the pilot students is very positive since they all highlighted the diversity of the topics covered by the different modules, such as land use, air pollution, soil and moisture, erosion and desertification, drought and flood, surface and groundwater pollution, dust storms and coastal management, but also the quality of the accompanying educational material and all explanations provided by the teachers.

Finally, the students mention that having to submit a project for weeks 6 and 7 allowed them to integrate knowledge and expertise gained during the previous weeks and helped them build an environmental change monitoring application from scratch and though all stages from data collection, processing, analysis and presentation of results using GIS and Remote Sensing software and applications.

Another strong point of the course as inferred from the students' comments, is the variety of software used for the exercises such as QGIS, SNAP, XYZWin, SQL, PostGIS, pgAdmin among others.

From all the above, it is no surprise that all students state that they learned a lot from the course which reveals that the course has reached its goal.

To sum up, the following points should be brought into the spotlight:

1. The course is evaluated positively in the majority of its aspects.
2. Both course content and structure meet the course developers' initial aims and objectives.
3. The course builds new and extends previous students' knowledge.
4. Students would like more prompt communication with the teachers, especially for modules with high difficulty or complexity.

Taking upon these, we can state that the course although somewhat difficult and demanding is significant in shaping students' knowledge in GIS and Remote Sensing as well as in applying this knowledge to Environmental Change Monitoring applications in the Middle East.

Course developers will take into account all suggestions of the pilot students and will try to make the necessary adjustments to the course contents, so that issues that have been raised are resolved for when the courses becomes available to regular students.

On behalf of the Course coordinating team,

Dr. Eleni Tomai, National Technical University of Athens

Course evaluation report by pilot students

Course: SDI-T for environmental change monitoring

Aim: This course aims at providing an in depth account of the use of GIS and RS as valuable resources for environmental change monitoring. Learners will be familiarized with concepts, techniques, algorithms, and tools to use in their professional endeavour for handling issues related to environmental management, e.g., detecting and measuring environmental variations. Students will also gain hands-on experience in designing field or laboratory based research projects to monitor environmental systems, making use of appropriate field, laboratory and measurement equipment.

Name and family name of the student: Ibrahim Saeed Ali Al-Samawi

Email: ibrahimg92003@gmail.com

1. Do you think that the aim, as described above, has been reached well in this course?

(1: Not at all, 5: Yes, completely)

☐ 1 ☐ 2 ☐ 3 ☒ 4 ☐ 5

Comments:

- Some of the applications in week 5 and 6 was not as we expect to learn from it

2. How was the workload of the course? (1: low, 3: fair, 5: high)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☒ 5

Comments:

- Except some of exercise and videos it was not download until we communicate with teachers and course coordinators

3. How do you grade the course as a whole? (1: very weak, 3: fair, 5: very good)

☐ 1 ☐ 2 ☐ 3 ☒ 4 ☐ 5

Comments:

4. Mark the strongest weeks of the course

☐ 1 ☒ 2 ☒ 3 ☐ 4 ☐ 5

☐ 6 ☐ 7

5. Why these weeks are strongest?

Comments:

The lecture was very good

The exercises was good and more practical

6. Mark the weakest weeks of the course:

☐ 1 ☐ 2 ☐ 3 ☒ 4 ☒ 5

☐ 6 ☐ 7

7. Why are these weeks the weakest?

Comments:

- Problems with data
- Problems with the communication with teachers
- The exercise was not explained with details
- Some of the exercises was not practical although it is very important

8. Which parts of the course do you recommend to omit?

Nothing

9. Why do you recommend omitting these parts?

10. What parts do you recommend to add to the course?

Comments:

More application in groundwater and water pollution

11. How was your background knowledge to this course? Was the course too easy or too complicated for your knowledge?

It was easy.

12. Grade the quality of contacts with lectures: (1: very weak, 3: fair, 5: very good)

☐ 1 ☐ 2 ☐ 3 ☒ 4 ☐ 5

Comments:

13. How do you evaluate the course?

(Write a summary of the course, what you have learnt, the quality of lectures, the quality of exercises, etc. at least, 3 pages report is expected)

WEEK1

- I learned a lot about the concepts of environmental change monitoring especially on the aspects of environmental change monitoring, methods of environmental change monitoring, and in particular how study environmental change based on satellite images, for example monitoring air pollution, studying of land-use changes, drought management, floods, and others. More importantly, the integration of the Environmental change department with the geographic information systems technology and remote sensing in order to map, measure, monitor and model environmental management. Also I learned more about the environmental indicators
- **Lectures**: the lectures were very good, but it was need for more details about requirement analysis for environmental change.
- **Exercises:** Theoretical exercises were sufficient. There was a need for a simple exercise on one of the environmental issues on how to control it and determine environmental indicators in a practical way through remote sensing data before entering the next lessons**.**

WEEK2 (GIS and Geovisualization)

- Since I am specialized in the field of geographic information systems. I reviewed the principles of geographic information system, and learned a new topics such as.

    1- Data acquisition (GPS, RS, Field surveying) Assignment

2- SQL training and reinforcement(Data quality – data analysis, Data integration, postgis).

3- Precision and quality of data.

- **Lectures**: the lectures were very good, and covered most of GIS aspects such as (GIS and Geovisualization, Geovisualization (cartography), Models and structures - Advanced models and structures (3D, Temporal), and Data acquisition (GPS, RS, Field surveying)).

  But we suggest adds lectures with more details for the following topics.

  1- Types of geodatabase, and the important of each type of it.

  2- Lectures with more details about Spatial Analysis operations, because it is important in the assessment of the quality of data.

- **Exercises**: I have the following comments about every exercises.

1- Data acquisition: Most of the topics in this exercise were related to the Remote Sensing and photogrammetry segment. Small parts were relate to geographic information system.

2- Digitization, raster-to-vector: This exercise was supposed to join under data acquisition an exercise by geographic information system, to learn how to collect data from maps and other sources of data.

3- Using Different Data Sources (with different CRS): part **A** and part **B** were a good exercise, but part **C** and **D** It was supposed to be applied within the GIS programs like QGIS and ARCGIS, because it is easier and within the work environment instead of any external programs with different procedures.

4- Import non-spatial data and join with spatial datasets - (Simple) SQL queries (part a , part b, and data): The exercises are very important and it was better to explain them in more detail. Because there was problems with exercises data.

5- spatial analysis operations: Excellent exercises.

(Week 3)Remote Sensing

- Also I have a good background about Remote Sensing, but, I learned some new thing like downloading remote sensing data from many sources, in addition to some methodology about the calculation of application like flooding.
- **Lectures**: the lectures were excellent, but we also suggest some lectures with more details about satellite images and image processing.
- **Exercises**: it was excellent ,but there is no link between lectures and exercises, for examples there is no application about image processing like geometric and radiometric correction.

(Weeks 4 and 5) Applications of GIS/RS in ECM .

- I learned a lot, especially from lectures about the background for every exercises for example Land use change and management (forest, vegetation changes), Air Quality Analysis, Soil moisture estimation, etc.
- **Lectures**: excellent lectures, but I suggest adds lectures about coastal zone managements and water pollutions.
- **Exercises**: it was a good exercise, but I have some comments about it as following
  - Some exercises have been indicated inside, the data was available in some links of websites , and when we connect with the website, the data was not available like Air Quality Analysis and Land use/Land cover change and management (compulsory) exercises.
  - Some exercises did not explain the steps in detail like Groundwater vulnerability assessment to pollution In order to know the production of the basic layers. the basic layer was available with the exercises but how it was generated we don't know.
  - Some of the exercises were tests without adding any lectures without any practical applications by remote sensing technology and geographic information system technology like Water pollution and Integrated Coastal Zone Management.

General notes and suggestions

- Some lectures and data we could not download until the communication with the course coordinator, and it needs for time until they solve the problem.
- Some of the teachers we sent them the exercises and some inquiries and they were very late in responding to inquiries and reviewing exercises.
- Reconsidering the fourth and fifth week exercises by explaining them in more detail, as they are the core of the work. Especially the exercises that were mentioned previously.
- In general, the course was excellent. I learnt a lot of things in lectures and exercises

Course evaluation report by pilot students

Course: SDI-T for environmental change monitoring

Aim: This course aims at providing an in depth account of the use of GIS and RS as valuable resources for environmental change monitoring. Learners will be familiarized with concepts, techniques, algorithms, and tools to use in their professional endeavour for handling issues related to environmental management, e.g., detecting and measuring environmental variations. Students will also gain hands-on experience in designing field or laboratory based research projects to monitor environmental systems, making use of appropriate field, laboratory and measurement equipment.

Name and family name of the student: Razie Ebrahimi
Email: Razie.ebrahimi1991@gmail.com

1. Do you think that the aim, as described above, has been reached well in this course?
(1: Not at all, 5: Yes, completely)

☐ 1 ☐ 2 ☐ 3 ☒ 4 ☐ 5

Comments:
Yes. I think the goal has been achieved a lot. But some teachings are not fully explained and a lot of effort and time had to be put into learning them. Also in this course I learned well to evaluate environmental changes.

2. How was the workload of the course? (1: low, 3: fair, 5: high)

☐ 1 ☐ 2 ☒ 3 ☐ 4 ☐ 5

Comments:
When we have enough free time, the workload is fair and sufficient, and we can complete and deliver assignments on time. But my situation was such that I am a student and I was busy doing my dissertation, I did not make good progress in terms of time. Finally, I am satisfied with the workload.

3. How do you grade the course as a whole? (1: very weak, 3: fair, 5: very good)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☒ 5

Comments:
In my opinion, the level of the course was very good, and with the training and comments that the professors gave about the answers, I learned a lot and taught me many points, and I learned more about the use of software.

4. Mark the strongest weeks of the course

☐ 1 ☐ 2 ☐ 3 ☒ 4 ☒ 5
☐ 6 ☐ 7

5. Why these weeks are strongest?

Comments:
Because weeks 4 and 5 cover and express the different topics. He has studied environmental issues in various fields and in each case he has mentioned the use of different data and software and has given good information. Also, the exercises that have been expressed in these weeks are more practical.

6. Mark the weakest weeks of the course:

☐ 1 ☐ 2 ☒ 3 ☐ 4 ☐ 5
☐ 6 ☐ 7

7. Why are these weeks the weakest?
Comments:
Because he has only taught one subject. Of course, for the same subject, comprehensive training has been given and the analysis has been said. But I think the thing to note about this week is that the software for these exercises, called Snap, could not be installed on every system, and I struggled a lot to run it. And I spent a lot of time installing it and about run it did not explain what system this software can be run on and with what specifications.

8. Which parts of the course do you recommend to omit?
In my opinion, section 2.4 should be omit.

9. Why do you recommend omitting these parts?
This section omit or better training should be provided for both how to install and how to work with it. Because the explanations given for the tutorials are vague and it is also not clear exactly what should be delivered in the exercise.

10. What parts do you recommend to add to the course?
Comments:
In my opinion, it was complete and comprehensive, and there is no need to add a section.

11. How was your background knowledge to this course? Was the course too easy or too complicated for your knowledge?
My knowledge was limited to using GIS for regional analysis as well as interpolation, and I was familiar with its other applications only in theory, but during this period I was able to become familiar with its applications in practice. Also, I was not at all familiar with the programs in the field of coordinate conversion and the Snap and Pgadmin program that I learned in this course. I need to point out that before this course I only used GIS, but in this course I also became acquainted with QGIS as another environment for regional analysis.

12. Grade the quality of contacts with lectures: (1: very weak, 3: fair, 5: very good)

☐ 1 ☐ 2 ☐ 3 ☒ 4 ☐ 5
Comments:
The quality of the presentations was good. In some videos, the quality of the pronunciations was not good, but since their text file was also provided, it can be said that it was a very good thing. Some items were not mentioned in the tutorials but were in the exercises. Also, some professors were late in answering questions or did not provide complete guidance.

13. How do you evaluate the course?

(Write a summary of the course, what you have learnt, the quality of lectures, the quality of exercises, etc. at least, 3 pages report is expected)

In the course I took, in the first week 1 understood the introduction of the course and its basic concepts and the goal that I am going to pursue in this course. I became familiar with monitoring environmental change, examining the types of changes and their sources, and learning how to analyze them.
The first week's exercises were well-organized and included basic concepts, allowing the student to learn how to write an article or scientific report on environmental events. The practice of preparing the questionnaire was very good because we were familiar with producing the questionnaire and analyzing it, but my suggestion is to give more training on how to write and prepare the questions.
In the second week, more on spatial distributions and their types are explained. Its characteristics and how to implement and relate them to spatial data are mentioned. The model and structure of spatial data, image resolution, size, shape and their cells are explained and examples of each are given. He introduced us to the types of raster data and how to obtain this data from spatial and real land features. The student becomes familiar with the types of errors between real data obtained from remote sensing methods and how to eliminate them. We became familiar with the types of coordinate systems and how to convert them into each other, which I think were very useful and practical in these tutorials.
We got acquainted with training, installation and working with pgadmin, postgresql software, but in my opinion, this discussion was very vague and incomprehensible, both in terms of training and the expression of its practice and the expression of the required items, and in fact it was very confusing and wasted time. It became a lot. In fact, I think it was very poorly done to teach and work with this software, and I did not learn much from it except for general topics.
There were also good explanations for obtaining different types of features in the data, such as the distances between them and the angles. The concept of the map and how to implement the various features and display them in the map were well expressed. The first, second, third and fifth exercises of this week were very good and of high quality and were practical, but the fourth exercise was incomprehensible and not well presented.
The training for the third week was excellent. There was good training in remote sensing. It was very practical and introduced us to its concept and the different types of remote sensing data and how to obtain and use them. This week's exercises were very good and well presented, but I had trouble installing Snap software because it could not be installed on any system, and this bothered me a lot. It would be better to explain the problems that may occur when installing this software.
The trainings of the fourth and fifth weeks were very good and during these trainings, various topics were discussed and for each case, a special exercise was provided for the training itself. Issues such as land use, air pollution, soil and moisture, erosion and desertification, drought and flood, surface and groundwater pollution and its causes, dust storms and coastal management, were topics that were well and completely expressed. And be analyzed and how to evaluate them was well taught. Overall, the variety and quality of expression of the required tutorials and exercises this week was very good and not boring for the user. However, the points that the teachers mentioned to answer these exercises also had an effect on learning the teachings.
At the end of the project that was requested, it was a good idea because the user had to from the beginning to the end of the topic and collect data and methods and how to analyze and review them and conclusions and evaluate and review them and take their creativity To apply.
Finally, I must point out that the variety of training provided and the exercises required was high, and this increases the user's knowledge in various cases of environmental issues.
But because the variety of activities was a lot and some exercises were not taught, it would take more time.
Finally, please keep in mind that since most students are also involved in university projects, it took time to deliver the exercises.

Course evaluation report by pilot students

Course: SDI-T for environmental change monitoring

Aim: This course aims at providing an in depth account of the use of GIS and RS as valuable resources for environmental change monitoring. Learners will be familiarized with concepts, techniques, algorithms, and tools to use in their professional endeavour for handling issues related to environmental management, e.g., detecting and measuring environmental variations. Students will also gain hands-on experience in designing field or laboratory based research projects to monitor environmental systems, making use of appropriate field, laboratory and measurement equipment.

Name and family name of the student: Elham Gohari

Email: elhamgohari477@gmail.com

1. Do you think that the aim, as described above, has been reached well in this course?

(1: Not at all, 5: Yes, completely)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ■ 5

Comments:

Yes, I think the above goals have been achieved and these training programs can be used to assess environmental changes.

2. How was the workload of the course? (1: low, 3: fair, 5: high)

☐ 1 ☐ 2 ■3 ☐ 4 ☐ 5

Comments:

The workload was fair and we were able to submit the exercises on time.

3. How do you grade the course as a whole? (1: very weak, 3: fair, 5: very good)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ■5

Comments:

In my opinion, these courses were quite purposeful and coherent, and with the useful lectures of the teachers, I was able to learn good points about how to use the software.

4. Mark the strongest weeks of the course

☐ 1 ☐ 2 ☐ 3 ■4 ■ 5

☐ 6 ☐ 7

5. Why these weeks are strongest?

Comments:

Because in the 4th and 5th weeks, environmental changes were assessed in the RS and GIS sections.

6. Mark the weakest weeks of the course:

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

☐ 6 ☐ 7

7. Why are these weeks the weakest?

Comments:

In my opinion, there was no weak week, each week was in a purposeful framework.

8. Which parts of the course do you recommend to omit?

In my opinion, Section 2.4 should be omit.

9. Why do you recommend omitting these parts?

This section should be provided with better training, the explanations given are vague and it is not even clear what report should be submitted.

10. What parts do you recommend to add to the course?

Comments:

In my opinion, the sections related to image processing should be added to remote sensing.

11. How was your background knowledge to this course? Was the course too easy or too complicated for your knowledge?

My knowledge of practical applications was less and I was more theoretically familiar with the applications of remote sensing, but in this period I was able to become more familiar with practical applications and gain good experiences.

12. Grade the quality of contacts with lectures: (1: very weak, 3: fair, 5: very good)

☐ 1 ☐ 2 ☐ 3 ■ 4 ☐ 5

Comments:

The quality of the presentations and text files was good. In general, the teaching method was good, but some professors were late in answering the questions or did not provide enough guidance.

13. How do you evaluate the course?

(Write a summary of the course, what you have learnt, the quality of lectures, the quality of exercises, etc. at least, 3 pages report is expected)

In this course, in the first week, an introductory course of concepts was presented. Also, in this week, the method of writing an article and reporting the work was well taught. These exercises provided the general principles of the concepts, and this week, the goal pursued was well presented.

In the second week, more is explained about spatial distribution, as well as how to implement and relate them to a set of spatial data. Introduce us to the types of raster data and how to obtain this data, Introduced coordinate systems and how to convert them to each other.

we also got acquainted with training, installation and working with Pgadmin, Postgresql software, but in my opinion, this discussion was poorly done in terms of training and reporting that should be delivered, and the exact main questions were not clear.This week provided useful explanations for obtaining different types of specifications in the data. The concept of the map and how to implement the various features and display them in the map is well expressed.

The practice of the third week was excellent in terms of training. The points provided were quite purposeful because we got acquainted well with the Snap software, and in my opinion, this week has performed better in terms of training than other weeks.

The exercises in the fourth and fifth weeks were very good due to the combination of the use of GIS and RS, and each of these trainings had different goals and a special training was provided for each case. The topics covered were in line with environmental changes that were well articulated and the variety of exercises and the quality of the training were very good, as well as the points made by the teachers in response to these exercises.

The last week was interesting because from the first to the last stage, the student had to do a series of analyzes to achieve the desired goal and also enable the student to collect data and select the desired area and how to do the work with software different. To achieve the desired goal and finally we got become more familiar with the implementation method and conclusion.

In general, the order and coherence of the lectures is required to provide lectures and exercises

They were quite purposeful. There was good communication between students and teachers. The variety of exercises was very good and there was enough time for this course.

Eventually I was able to become familiar with monitoring environmental change and analyze the types of change and learn more practical applications.

Course evaluation report by pilot students

Course: SDI-T for environmental change monitoring

Aim: This course aims at providing an in depth account of the use of GIS and RS as valuable resources for environmental change monitoring. Learners will be familiarized with concepts, techniques, algorithms, and tools to use in their professional endeavour for handling issues related to environmental management, e.g., detecting and measuring environmental variations. Students will also gain hands-on experience in designing field or laboratory based research projects to monitor environmental systems, making use of appropriate field, laboratory and measurement equipment.

Name and family name of the student: Fatemeh Mahdavipour

Email: fatemehmahdavipoor@gmail.com

1. Do you think that the aim, as described above, has been reached well in this course?

(1: Not at all, 5: Yes, completely)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☒ 5

Comments:

Yes, the goal is well achieved in this course.

Through these courses, we learned to evaluate environmental change well.

2. How was the workload of the course? (1: low, 3: fair, 5: high)

☐ 1 ☐ 2 ☒ 3 ☐ 4 ☐ 5

Comments:

The workload was good and the time allotted for the exercises and the project was appropriate.

3. How do you grade the course as a whole? (1: very weak, 3: fair, 5: very good)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☒ 5

Comments:

The level of the course was excellent, some of the professors explained the lessons very well and guided me well in some of the lessons, and I learned a lot and learned the software environments related to each of these lessons very well.

4. Mark the strongest weeks of the course

☐ 1 ☐ 2 ☒ 3 ☒ 4 ☒ 5

☐ 6 ☐ 7

5. Why these weeks are strongest?

Comments:

Weeks 3, 4 and 5 were very practical and useful. In Week 3, I learned how to load Sentinel data and the basic use of the ESA SNAP toolbox. Also, weeks 4 and 5 mention various topics in the fields of QGIS and Remote Sensing (RS) and the use of software related to QGIS and remote sensing are well expressed.

6. Mark the weakest weeks of the course:

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

☐ 6 ☐ 7

7. Why are these weeks the weakest?

Comments:

In my opinion, all the courses were good and useful and not weak, and each of the courses had useful and practical training in different fields.

8. Which parts of the course do you recommend to omit?

In my opinion, section 2.4 should be omit.

9. Why do you recommend omitting these parts?

In this section, the explanation is weak and should be expressed in a better way, and its details and application should be stated more accurately.

10. What parts do you recommend to add to the course?

Comments:

I think the sections were complete and there is no need to add sections.

11. How was your background knowledge to this course? Was the course too easy or too complicated for your knowledge?

I had used QGIS and SNAP software in limited fields and subjects before this course, but in this course I learned many applications of QGIS and SNAP software and used them in different fields and for me His training in various fields was easy. Also, I was not at all familiar with the PgAdmin and SQL programs learned in this course and it was very complicated for me.

12. Grade the quality of contacts with lectures: (1: very weak, 3: fair, 5: very good)

☐ 1 ☐ 2 ☐ 3 ☒ 4 ☐ 5

Comments:

The quality of the presentations in the films was good and the texts related to the presentations were well available.

Some of the tutorials related to the exercises were not in the videos and texts.

Some professors were very quick to respond to the results of the exercises but some were slow to respond, also some professors gave good guidance but a limited number of professors did not give full guidance.

13. How do you evaluate the course?

(Write a summary of the course, what you have learnt, the quality of lectures, the quality of exercises, etc. at least, 3 pages report is expected)

In the first week, given the introduction to the whole course, I became familiar with monitoring environmental changes and their overall concept and analysis, as well as its application to the environment. The videos and texts that were prepared for the first week were perfectly organized and the professors presented them well and useful material was presented in these presentations. Teach students how to write scientific articles and reports on environmental change, including parameters such as pollution, land use management, ecology, natural resource monitoring, climate change, and more. We also learned about the importance of analysis needed to monitor environmental change by preparing questionnaires from people about their understanding of environmental change, which was very useful.

In the second week, I became acquainted with GIS, which manages spatial information and is used to solve space dimension problems. Also, the relationship between spatial and temporal data and how to implement them is stated. Models and spatial data structures are expressed. Spatial data models are defined as conceptual designs to represent geographic space. These models include the Field-based model and the object-based model. Also, specific geometry (size, shape, etc.) and thematic information (attributes, properties, etc.) are stated and examples of them are given. We became familiar with two types of data structures, including the checkered structure and the vector structure, and learned how to obtain this data from spatial and terrestrial properties. In the next section, we learned about the computational methods of coordinate reference systems and how to convert them together. In general, we are also familiar with the types of errors obtained from two-dimensional measurement and how to eliminate them. We align our data

with the available spatial data in the map coordinate system. The speeches, texts and videos in this section were very productive and useful. In my opinion, topics related to GIS and remote sensing are very useful and practical. In this section, I got acquainted with PgAdmin and PostgreSQL software, which I was not familiar with at all before this course, and this section was very vague for me, and the lectures and training with this software were not mentioned well, but in the form of The theory was well stated. It was generally poor in software training but well expressed in theory training. In this tutorial, I learned that PostgreSQL is a database engine that implements SQL standards, and pgAdmin is an advanced, open source, complete, and featured web management tool for the PostgreSQL database server. In this section, we learned various practical skills for performing the most common spatial operations in QGIS and how to perform various features, as well as how to obtain the specifications in the data and the differences between them and the distance between objects and changes in the forest area. And we understood the vegetation well on the map. In general, in the second week, sections 1, 2, 3, and 5 were very useful and practical, and the professors taught them with quality, but in section four, the program was vague for me, but I got good information in theory.

Week 3 was very good, useful and practical in the field of remote sensing.The teacher explained the lesson very well and gave practical and detailed points in the lesson, and we learned a lot about Sentinel data download and the basic use of the ESA SNAP toolbox. I think this week was great in terms of education.

In weeks four and five, two topics were used in the field of GIS and RS, which were very useful and practical, and each had specific goals in their field, and also different topics were discussed and analyzed. The professors presented the topics in this field very well and with quality and expressed good and useful points in these topics. Topics this week were very diverse and practical, such as Land use/Land cover, Air Quality, soil moisture, Land degradation, Droughts and flood, soil moisture, groundwater, Water pollution, Dust storms and coastal management. These topics were well analyzed and how to evaluate them was well taught.

In my opinion, weeks 3, 4 and 5 were excellent and useful in the field of RSS and GIS, and I learned very useful and practical topics.

In general, in this course, all the courses were excellent and purposeful, the topics were well organized, and also good communication was established between the professors and the students, and the professors guided the students well.

Given the topics covered in this course and the diversity of education in different fields, doing the project was a great idea because students choose a topic based on what they are learning and collect data based on the topic and They analyze and finally conclude and evaluate them.