**Syllabus**

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| Discipline’s code | Discipline’s title |  | Number of ECTS | SWSTSelf-work of student with teacher in hours |
| Lect. | Pract. | Lab. |
|  | Marine pollution, detection and mapping  | 7 | 3 | 1 | 5 | 40 |

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| Academic presentation of the course | **Aim of course:** …**As a result of studying the discipline, students should be able to:**1. Summarise pollution sources and types in marine environment
2. Summarise the concepts for deriving water quality variables using data acquired by active and passive sensors.
3. Produce geographic maps of water quality variables (including oil spill) from satellite imageries
4. Analyse data records of marine related essential climate variables
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| Prerequisites | Tertiary education in science, mathematics, technology and engineering Basic skill in statistical analysis  |
| Post requisites |  |
| Information resources  | **literature**:* Acker, J., Williams, R., Chiu, L., Ardanuy, P., Miller, S., Schueler, C., Vachon, P.W., Manore, M., 2014. Remote Sensing from Satellites☆, in: Reference Module in Earth Systems and Environmental Sciences. Elsevier. https://doi.org/10.1016/B978-0-12-409548-9.09440-9
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* ESA - Climate from Space [WWW Document], n.d. URL https://cfs.climate.esa.int (accessed 4.21.21).
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**Internet-resources:** Principles of Remote Sensing<https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesremotesensing.pdf>Ocean optics<https://www.oceanopticsbook.info> Essential climate variables<https://climate.esa.int/en/evidence/role-eo-understanding-climate-change/>  |

Calendar (schedule) the implementation of the course content**:**

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| --- | --- | --- | --- |
| Week / date | Topic title (lectures, practical classes, Independent work of students, IWS) | Number of hours | Maximum score |
| 1 | Lecture 1. Basics of remote sensing above water | 1 |  |
| Practical class 1. Accessing Data of the Copernicus Marine Service (CMEMS) | 2 |  |
| 1 | Lecture 2. Data retrieval and handling  | 1 |  |
| Practical class 2. Data retrieval and handling  | 8 |  |
| 2 | Lecture 3. Marin pollution Lecture 4. Light and water Lecture 5. Deriving water quality variables from remote sensing data | 3 |  |
| Practical class 3 Deriving water quality variables from remote sensing data | 8 |  |
| 3 | Lecture 6. Oil spill detection  | 1 |  |
| Practical class 3 Oil spill detection | 8 |  |
| 3 | Lecture 7.Climate change and the seas  | 3 |  |
| 4 | Self-work of student with teacher: SWST. Analyse data records of marine related essential climate variables: a case study from the Caspian sea | 40 |  |