**Syllabus**

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| --- | --- | --- | --- | --- | --- | --- |
| Discipline’s code | Discipline’s title |  | | | Number of ECTS | SWST  Self-work of student with teacher in hours |
| Lect. | Pract. | Demo |
|  | Applications for Environmental protection, GEONETCast | 4 | 8 | 2 | 6  Total hours:  180 | 60 |

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| --- | --- |
| Academic presentation of the course | **Aim of course:** Participants are able to apply the data provided through GEONETCast for (near real time) water resources and environmental analysis and protection  **As a result of studying the discipline, students should be able to:**   1. Understand the capability of GEONETCast, the system setup and the data provided 2. Able to apply the GEONETCast Toolbox, provided as a plug-in under ILWIS386, to import and pre-process some Geostationary and Polar orbiting satellites and derived products, using a set of guided exercises 3. Apply ILWIS to further process obtained data, using a set of guided exercises 4. Conduct time series visualization and calculations, using a set of guided exercises 5. Use command line utilities in conjunction with ILWIS386 for efficient data retrieval and processing 6. Apply ILWIS 386 WMS functionality using EUMETVIEW on meteorological image datasets over Central Asia for MSG-IODC 7. Make use of the Data Tailor capability offered by EUMETSAT and import Geostationary Satellite images |
| Prerequisites | Tertiary education in science, mathematics, technology and engineering  Basic skill in statistical analysis and use of ILWIS386 |
| Post requisites |  |
| Information resources | **Literature:**  Maathuis, B.H.P., Mannaerts, C.M. and Retsios V. (2020). GEONETCast Toolbox. Installation, configuration and user guide of the GEONETCast-Toolbox plug-in for ILWIS 3.8.6. Version 2.  Ben H.P. Maathuis, Chris M.M. Mannaerts: ILWIS Open Toolbox plug-ins for efficient atmospheric, land and marine data retrieval and processing. AfricaGIS, November 2013, Addis Ababa, Ethiopia.  **Internet-resources:**  Link to all resources:  <https://www.itc.nl/about-itc/organization/scientific-departments/water-resources/ilwis3-and-toolbox-plugins>  Latest ILWIS 386 software:  <https://filetransfer.itc.nl/pub/52n/ILWIS386/Software/>  GEONETCast toolbox plug-in Installation Instructions:  <https://filetransfer.itc.nl/pub/52n/ILWIS386/Toolbox_plugin/GEONETCAST_TB_install.pdf>  GEONETCast Toolbox Exercises:  <https://filetransfer.itc.nl/pub/52n/ILWIS386/Toolbox_plugin/GNC_Toolbox_Manual_V2.0.pdf>  GEONETCast exercise and tutorial data:  <https://filetransfer.itc.nl/pub/52n/gnc_exercisedata/gnc_data/>  Data Tailor and EUMETVIEW:  <https://www.eumetsat.int/data-tailor>  <https://view.eumetsat.int/productviewer>  Provided via Digital Learning Environment:  Additional reference documents relevant to understand the data and products provided and use of the ILWIS WMS and EUMETVIEW / Data Tailor capability |

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. Introduction to GEONETCast and building reception station | 2 |  |
| Practical class 1. Toolbox installation and Import of Geostationary Satellite and different channel visualizations | 8 |  |
| 1 | Lecture 2. Receiving data through GEONETCast, Service registration, Product Navigator, User Notification Service (UNS) and Operational Service Status Indicator (OSSI) | 2 |  |
| Practical class 2. Multi-temporal geostationary data import and processing | 8 |  |
| 1 | Lecture 3. GEONETCast toolbox plug-in setup and open design | 2 |  |
| Practical class 3. Retrieval of Meteorological products (MPEF) and from the Satellite application Facilities | 8 |  |
| 2 | Lecture 4. ILWIS in combination with command line utilities like MS-DOS / GDAL and linkage to toolbox routines | 2 |  |
| Practical class 4: Use of MS-DOS / GDAL for time series data processing, application example 15 minutes rainfall time series (Multi Sensor Precipitation Estimate – MPE, over Central Asia) | 6 |  |
| 2 | DEMO: Multi temporal Geostationary and Polar Orbiting data import and processing | 2 |  |
| DEMO: EUMETVIEW and WMS in ILWIS386 | 2 |  |
| Practical class 5: Using For-Do loops to automate multiple file retrieval and processing and retrieval - (pre‐)processing of time series using a dual batch file technique | 8 |  |
| 3 | Practical class 6 - 8: Import and pre-process data in GEONETCast available over central Asia, application of other relevant routines (using open data archives) and retrieval of data from the EUMETSAT Data Store / Data Tailor | 40 |  |
| 4 -5 | Self-work of student with teacher support:  Continue to execute exercises as described in Chapter 4 of the GNC-Toolbox manual and Data Tailor Manual, including the use of open and free data archives | 60 |  |
| 5 | Assignment: Processing of selected dataset and prepare a multi-temporal assessment, prepare short report | 30 |  |
|  | Total number of hours | 180 |  |

Remark:

Students will start to work on sample data disseminated through GEONETCast to get them familiarized with the data and products. Additionally tools and capabilities are offered to acquire, without the need for a local ground reception station, to retrieve and work with selected data contained within the GEONETCast data stream using the EUMETSAT Data Tailor (raw data) and EUMETView (processed data), as well as relevant environmental data from open and free data archives using retrieval routines made available within the GEONETCast Toolbox plug-in.