Line of Development - 20

Space

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LoD 20 (Space)

Recognize the critical mass of Academic staff related to space.

No	Academy	Country
1	AGA	Spain
2	HAA	Greece
3	PAFU	Poland
4	HCAFA	Romania
5	HCAFA	Romania
6	Portuguese Air Force Academy	Portugal
7	SPAFA	Spain
8	FASFA	France
9	TMA	Austria
10	Georgi Benkovski Air Force Academy	Bulgaria
11	PAFU	Poland
12	PAFU	Poland
13	HAFA	Greece
14	HAFA	Greece
15	FR NAVAL ACADEMY ECOLE NAVALE	France
16	PAFU	Poland
17	CUD - SAN JAVIER	Spain
18	PAFU	Poland

Please share with the LoD the contact details of all academics that might be related to Space domain.

AGENDA (65nd IG)

- Set the fundamental topics of a common module
- Complete a first draft for the common module
- Circulate the common module draft for evaluation

AGENDA (65nd IG)

Common Module
Space-based ISR & Situational Awareness
(SB ISR & SA)
Module Description

Implementation Group
Doc.: IG/ XXXX
Date: DD MM YYYY
Origin: XXXXX

Country	Institution	Common Module	ECTS
GR	Hellenic Army Academy	Space-based ISR & Situational Awareness (SB ISR & SA)	2.0 (+ 1.0 e-learning)

Service: **ALL** Language: **English**	**Minimum Qualification for Lecturers** • Fully qualified Geospatial Engineer Officer. • Outstanding knowledge of Earth Observation and Remote Sensing Science. • Advanced experience in Geo-Intelligence. • Teaching experience in the field of Geospatial Engineering and Earth Observation. • English: Common European Framework of Reference for Languages (CEFR) Level B2 or NATO STANAG Level 3.
SQF MILOF	**Competence area** - Military technician **Learning area** – C4ISR systems & Space **Organisation level** - Single service

Prerequisites for international participants	Goal of the Module
• English: Common European Framework of Reference for Languages (CEFR) Level B2 or NATO STANAG Level 3. • Basic knowledge of IT (ECDL) or similar knowledge".	• Familiarise with the capabilities provided by the Copernicus Earth Observation SESA (Support to EU External and Security Actions) component • Exploit the SESA capabilities for ISR • Exploit the SESA capabilities for Situational Awareness

Learning outcomes		
	Knowledge	• Gain knowledge of different satellite types, orbits, and payloads used for ISR and SA. • Learn the principles of remote sensing. • Be familiar with data processing techniques for ISR and SA applications.
	Skills	• Analyze satellite imagery for military intelligence applications. • Interpret multi-source ISR data for situational awareness. • Apply basic image processing techniques in ISR & SA analysis. • Use satellite-derived information for decision-making in operational scenarios. • Demonstrate basic proficiency in GEOINT tools for ISR & SA.
	R & A	• Demonstrate critical thinking in analyzing ISR and SA data and recognizing operational threats. • Work effectively in teams to evaluate ISR intelligence and formulate responses. • Understand the capabilities of using SB intelligence in military and security environments.

Verification of learning outcomes:
- **Observation**: Throughout the module, students will discuss topics within syndicates and in the plenary. During this work, students are evaluated to verify their performance.
- **Evaluation:** Group presentations of given topics.
- **Test**: Written exam (multiple choice) at the end of the Module.

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Module details

Main Topic	Residential WH	E-learning	Details
Introduction to Space-Based ISR & SA	2	2	• Overview of ISR (Intelligence, Surveillance, and Reconnaissance) and SA (Situational Awareness) • History and evolution of space-based ISR & SA • Key advantages and challenges • Types of satellites used for ISR (e.g., optical, radar, signals intelligence) and SA • Satellite sensors and payloads
Fundamentals of Remote Sensing	3	2	• Basics of optical, radar, and hyperspectral imaging • Resolution (spatial, temporal, spectral) • Image acquisition and pre-processing
Image Processing for ISR	4 (inc. 2 SW)	3	• Image processing techniques • Practical session on image processing techniques
Image Analysis for ISR	3 (inc. 2 SW)	3	• Operational requirements for ISR and SA addressed by space-based assets • Practical session on image interpretation and analysis
Space-Based Communications, Navigation, Positioning	2	2	• Role of satellites in military communications • Secure data transmission and encryption • Satellite-ground station interaction • GNSS systems in ISR • Role in precision targeting and navigation • Jamming and spoofing threats
Threats to Space-Based ISR	2	2	• Space Surveillance and Tracking / Space Situational Awareness (SST/SSA) • Anti-satellite (ASAT) weapons and electronic warfare • Cybersecurity threats to space assets
Applications of ISR and Situational Awareness in Military Operations	5 (incl 4 SW)		• ISR in border security, battlefield awareness, and maritime surveillance • Tactical and operational applications of ISR data • Integration of ISR data with command and control (C2) systems
Demonstration and Scenario-Based Training	5 (incl 4 SW)		• Group exercises using open-source satellite imagery
Exams	2	1	• Final Exam • Self-evaluation tests
Total lectures and e-learning lessons	**28 (16+12 SW)**	**15**	A minimum of AKUs is part of the regular CM and is required in order to have a minimum of common knowledge before the residential phase. In addition, in the case of a 3 ECTS SB-ISR-SA CM Version, it is required that 1/3 of lectures are via e-learning. In both cases, the selection of e-learning topics is up to the Course Director mainly by using the e-learning materials available on the ESDC platform or provided by the institute.
Self-Studies	**22**	**10**	• Self-studies, pre-readings & self-evaluation tests. • E-learning may also be counted as self-studies.
Total	**50 (2 ECTS)**	**25 (1ECTS)**	The detailed amount of hours for the respective main topic is up to the course director according to national law or the home institution's rules

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List of Abbreviations:

AKU .... Autonomous Knowledge Unit
ASAT .... Anti-Satellite
B2 .... Common Reference Levels
C2 .... Command and Control
C4 .... Command, Control, Communication, and Computers
CEFR .... Common European Framework of Reference for Languages
CM .... Common Module
ECDL .... European Computer Driving Licence
EU .... European Union
ECTS .... European Credit Transfer and Accumulation System
GEOINT .... Geospatial Intelligence
GR .... Greece
IG .... Implementation Group
ISR .... Intelligence, Surveillance and Reconnaissance
IT .... Information Technology
NATO .... North Atlantic Treaty Organisation
NF .... Normalized Form
SA .... Situational Awareness
SB .... Space-Based
SESA .... Support to EU External and Security Actions
SSA .... Space Situational Awareness
SST .... Space Surveillance and Tracking
STANAG .... Standardization Agreement
SW .... Syndicate Work
WH .... Working Hour

LoD 20 (Space)

- Draft Common Module has been circulated among LoD-20 particpants
- Resposnses / Comments / Ideas until 25th of March
- Compile a final version
- Coordinate with Harry and present CM in the next IG meeting
- Plan to provide this CM during the Academic year 2025-2026

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- Vice-Chair: Asst. Professor Panagiotis Papakanelos (HAFA)
- Prepare and submit a document for the LoD work so far.

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