

Wykład profesora wizytującego / Visiting Professor lecture

Wykładowca/ Lecturer : Professor, Dr. Felix Yanovsky - National Aviation University (NAU)

Daty prowadzenia zajęć/ Dates of classes: 13.11.2014-28.11. 2014

**Zapisy na zajęcia** – osoby zainteresowane proszę o kontakt mailowy [krozycka@meil.pw.edu.pl](mailto:krozycka@meil.pw.edu.pl) z tytułem:

**Radar Systems of Aircraft- TAK + imię i nazwisko**

albo bezpośrednio w pokoju 128 (Dziekanat Zaoczny na Wydziale Mechanicznym Energetyki i Lotnictwa) w godzinach otwarcia Dziekanatu.

If you want to take part in the class please – send the e-mail to [krozycka@meil.pw.edu.pl](mailto:krozycka@meil.pw.edu.pl) with the title:

**Radar Systems of Aircraft- Yes + Your name and surname**

or personally in room 128 (Faculty of Power and Aeronautical Engineering building, Extra-mural studies Deanery) during the opening hours.

Data końca zapisów na przedmiot/ The deadline for subject enrolment - **10.11.2014**

Data/ Date	Dzień/Day	Godziny/ Hours	Sala/ Room	Konspekt/ Subject
13.11.2014	Czwartek Thursday	08.15-10.00 (2h)	Sala A1 Faculty of Power and Aeronautical Engineering/ Wydział Mechaniczny Energetyki i Lotnictwa	Basics of Radar
17.11.2014	Poniedziałek Monday	16.15-20.00 (4h)	Sala A0 Faculty of Power and Aeronautical Engineering/ Wydział Mechaniczny Energetyki i Lotnictwa	Basics of radar General overview and classification of airborne radar systems
18.11.2014	Wtorek Tuesday	16.15-18.00 (2h)	Sala A2 Faculty of Power and Aeronautical Engineering/ Wydział Mechaniczny Energetyki i Lotnictwa	Airborne weather radar
19.11.2014	Środa Wednesday	13.15-15.00 (2h)	Sala A1 Faculty of Power and Aeronautical Engineering/ Wydział Mechaniczny Energetyki i Lotnictwa	Airborne weather radar
20.11.2014	Czwartek Thursday	08.15-10.00 (2h)	Sala A1 Faculty of Power and Aeronautical Engineering/ Wydział Mechaniczny Energetyki i Lotnictwa	Airborne weather radar
21.11.2014	Piątek Friday	14.15-18.00 (4h)	Sala A0 Faculty of Power and Aeronautical Engineering/ Wydział Mechaniczny Energetyki i Lotnictwa	Airborne weather radar Secondary radar systems of ATC
24.11.2014	Poniedziałek Monday	16.15-20.00 (4h)	Sala A0 Faculty of Power and Aeronautical Engineering/ Wydział Mechaniczny Energetyki i Lotnictwa	Secondary radar systems of ATC Traffic alert and collision avoidance systems
25.11.2014	Wtorek Tuesday	16.15-18.00 (2h)	Sala A2 Faculty of Power and Aeronautical Engineering/ Wydział Mechaniczny Energetyki i Lotnictwa	Traffic alert and collision avoidance systems
26.11.2014	Środa Wednesday	13.15-15.00 (2h)	Sala A1 Faculty of Power and Aeronautical Engineering/ Wydział Mechaniczny Energetyki i Lotnictwa	Automatic Dependent Surveillance (ADS).
27.11.2014	Czwartek Thursday	08.15-10.00 (2h)	Sala A1 Faculty of Power and Aeronautical Engineering/ Wydział Mechaniczny Energetyki i Lotnictwa	Airborne passive radar systems
28.11.2014	Piątek Friday	08.15-10.00 (2h) 14.15-16.00 (2h)	T-204 Institute of Heat Engineering Instytut Techniki Ciepłej	Ground proximity warning systems (GPWS). <b>Summary and review</b>

Plan godzinowy / Number of hours –30 h

# Radar Systems of Aircraft

## Konspekt

**1. Basics of radar.** Terms and definitions. Principle of radar. Radar classifications. Radar tasks. Signal detection. Radar equation. Radar parameters. Resolution. Radar measurement. (4h)

**2. General overview and classification of airborne radar systems.** Classification of airborne radar equipment based on their functions and other features. (2h)

**3. Airborne weather radar.** Dangerous Meteorological Phenomena (DMP) and their influence on flight safety. Localization of DMP using radar methods. Weather radar as standard and perspective avionic equipment. Coherent meteorological radar and Doppler-polarimetric radar. Airborne weather radar design. (8h)

**4. Secondary radar systems of ATC.** Surveillance systems in ATC. Air Traffic Management and Free Flight concept. Structures of secondary radar systems. Interrogation and reply coding and data transfer in modes A, C and S. Side lobes suppression. Mode S Protocols of message transfer. error protection. Principles of airborne transponder design. (4h)

**5. Traffic alert and collision avoidance systems.** Terms and definitions. TCAS concept and basic principles. TCAS logics. Information representation. Traffic advisory and resolution advisory. Examples of system implementation. TCAS II and TCAS IV. (4h)

**6. Automatic Dependent Surveillance (ADS).** Basic principles. ADS -B. System architecture. Airborne equipment. Practical tasks and advantages of ADS-B. ADS-B as collision avoidance system. ADS-B and meteorological information (2h)

**7. Airborne passive radar systems,** Principles, Passive systems for detecting thunderstorm activity. Methods of lightning position determination from airborne. (2h)

**8. Ground proximity warning systems (GPWS).** Purpose and basic principles. GPWS evolution. Modes of operation. Enhanced GPWS. Examples of implementation. (2h)

**9. Summary and review** (2h)

Totally 30 h