

DESCRIPTION OF THE COURSES

- Course code: ARR 1101
- Course title: ELECTROMAGNETIC COMPATIBILITY
- Language of the lecturer: Polish

| <i>Course form</i> | <i>Lecture</i> | <i>Classes</i> | <i>Laboratory</i> | <i>Project</i> | <i>Seminar</i> |
|--------------------------------------|----------------|----------------|---------------------------|----------------|----------------|
| <i>Number of hours/week*</i> | <i>1</i> | | <i>1</i> | | |
| <i>Number of hours/semester*</i> | <i>15</i> | | <i>15</i> | | |
| <i>Form of the course completion</i> | <i>test</i> | | <i>laboratory reports</i> | | |
| <i>ECTS credits</i> | <i>2</i> | | <i>1</i> | | |
| <i>Total Student's Workload</i> | <i>60</i> | | <i>30</i> | | |

- Level of the course (basic/advanced): basic
- Prerequisites: Basic Electronics, Power Electronics
- Name, first name and degree of the lecturer/supervisor: Janusz Fleszyński, prof., D. Sc. Ph. D., B. Eng.
- Names, first names and degrees of the team's members: Janina Pospieszna, D. Sc, Ph. D., B. Eng., pozostali – jak w polskim – Ph. D., B. Eng.
- Year:.....IV..... Semester:.....7.....
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):
Acquiring of basic knowledge, which is needed to understand, and practically resolve problems of electromagnetic compatibility.
- Form of the teaching (traditional/e-learning): traditional
- Course description:
The course introduces to Electromagnetic Compatibility (EMC) and presents the following EMC problems: electromagnetic threats of lightning strikes and electrostatic discharges, electromagnetic disturbances generated by converter fed drives, methods and systems of overvoltage protection of electrical installations and devices, theoretical and practical aspects of electromagnetic field screening.
- Lecture:

| <i>Particular lectures contents</i> | <i>Number of hours</i> |
|--|------------------------|
| 1. Introduction, basic problems and requirements of EMC. | 1 |
| 2. Sources of external electromagnetic disturbances. Lightning discharges | 2 |
| 3. Lightning and overvoltage protection of installations and devices in buildings | 2 |
| 4. Nonlinear protective elements and systems | 2 |
| 5. Electrostatic discharges: phenomena, parameters, threats, remedial measures | 1 |
| 6. Electromagnetic compatibility problems of drive systems. Power electronic converters as sources of electromagnetic interferences. | 2 |
| 7. Filters and compensating – filtering systems. | 2 |

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|---|---|
| 8. Problems of electromagnetic field screening. | 2 |
| 9. New electromagnetic materials and techniques of electromagnetic field screening. | 1 |

- Classes – the contents:

- Seminars – the contents:

- Laboratory – the contents:

Laboratory classes familiarize the students with techniques of:

- measuring of electromagnetic interferences,
- measuring of protective devices characteristics,
- simulation of electromagnetic threats.

- Project – the contents:

- Basic literature:

1. A. Charoy, Zakłócenia w urządzeniach elektronicznych, t. 1-4, WNT, Warszawa 1999.
2. A. Sowa, Kompleksowa ochrona odgromowa i przepięciowa, Biblioteka COSiW SEP, Warszawa, 2005.
3. L. Frąckowiak, Energoelektronika, Cz. 2, Wyd. Politechniki Poznańskiej, Poznań, 2000

- Additional literature:

1. T. Więckowski, Badania kompatybilności elektromagnetycznej urządzeń elektrycznych i elektronicznych, Oficyna Wydawnicza PWr, Wrocław, 2001.
2. Praca zbiorowa pod red. D.J. Bena, Impulsowe narażenia elektromagnetyczne, Wyd. Politechniki Wrocławskiej, Wrocław, 1994.
3. P. Haase, Overvoltage protection of low voltage systems, IEE, London, 2000.
4. V. Prasad Kodali, Engineering Electromagnetic Compatibility, IEEE Press, New York, 1996.

- Conditions of the course acceptance/creditation:

Positive mark of test, pass of all laboratory exercises.

* - depending on a system of studies