

**Course name:**  
**Plant Genomics**

|   |   |
|---|---|
| ECTS  | 3   |
| Course status                                   | <i>facultative</i>  |
| Course final assessment /evaluation of outcomes | <i>Exam</i>   |
| Prerequisite                                    | <i>plant biology, basic biochemistry, conventional and molecular genetics</i> |

**Main field of study:**

Agriculture and Horticulture, Biology and Biotechnology (Erasmus+)

|                                     |  |
|-------------------------------------|--|
| Educational profile                 | General academic                                 |
| Code of studies and education level | bachelor/engineer (SI) or master of science (SM) |
| Semester of studies                 | Winter or Summer                                 |
| Language of instruction             | English  |

**Course offered by:**

|  |                                 |
|--|---------------------------------|
| Name of faculty offering the course    | Biotechnology and Horticulture  |
| Name of department offering the course | Plant Biology and Biotechnology |
| Course coordinator                     | Prof. Dariusz Grzebelus         |

**Learning outcomes:**

| Symbol of outcome                                 | Description of the learning outcome   | Reference to main field of study outcomes | Area symbol* |
|---|---|---|--------------|
| <b>KNOWLEDGE – student knows and understands</b>  |   |   |              |
| PLG_W1  | Key issues in structural, functional and comparative genomics               | EPB2_W02                                  | R, P         |
| PLG_W2  | Basic methods of genome analysis  | EPB2_W01<br>EPB2_W02                      | R, P         |
| PLG_W3  | Principles and methods of DNA sequencing                                    | EPB2_W01<br>EPB2_W02                      | R, P         |
| PLG_W4  | Basic principles of plant genome evolution                                  | EPB2_W02                                  | R, P         |
| <b>SKILLS – student is able to</b>                |   |   |              |
| PLG_U1  | Utilize online genomic resources and databases of DNA and protein sequences | EPB2_U03<br>EPB2_U04                      | R, P         |
| PLG_U2  | Perform basic analyses of DNA sequences in silico                           | EPB2_U01<br>EPB2_U04                      | R, P         |
| PLG_U3  | Align DNA and protein sequences and evaluate their similarity               | EPB2_U01<br>EPB2_U04                      | R, P         |
| <b>SOCIAL COMPETENCIES – student is ready to:</b> |   |   |              |
|   |   |   |              |
|   |   |   |              |

**Teaching contents**

|          |          |
|----------|----------|
| Lectures | 15 hours |
|----------|----------|

|        |  |
|--------|--|
| Topics | <ol style="list-style-type: none"> <li>1. Structural and functional genomics.</li> <li>2. <i>Arabidopsis thaliana</i> as a model plant genomes.</li> <li>3. Methods of genome analysis, genome annotation.</li> <li>4. Evolution of plant genomes, mobile genetic elements.</li> <li>5. Comparative genomics.</li> </ol> |
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|                                |                    |
|--------------------------------|--------------------|
| Accomplished learning outcomes | EPB2_W01, EPB2_W02 |
|--------------------------------|--------------------|

|   |                                       |
|---|---------------------------------------|
| Means of verification, rules and criteria of assessment | <i>Test exam, single choice (51%)</i> |
|---|---------------------------------------|

|          |          |
|----------|----------|
| Classes: | 15 hours |
|----------|----------|

|        |   |
|--------|---|
| Topics | <ol style="list-style-type: none"> <li>1. Exploration of online sequence databases (DNA and protein).</li> <li>2. In silico analysis of DNA sequences.</li> <li>3. Sequence alignment and similarity, identification of polymorphisms.</li> </ol> |
|--------|---|

|                                |                              |
|--------------------------------|------------------------------|
| Accomplished learning outcomes | EPB2_U01, EPB2_U03, EPB2_U04 |
|--------------------------------|------------------------------|

|   |   |
|---|---|
| Means of verification, rules and criteria of assessment | <i>Case report, demonstration of practical skills (49%)</i> |
|---|---|

### References:

|               |   |
|---------------|---|
| Basic         | <p><i>Meksem K, Kahl G (eds.), 2005. The Handbook of Plant Genome Mapping. Wiley-VCH, Weinheim.</i></p> <p><i>Sensen CW (ed.), 2005. Handbook of Genome Research. Wiley-VCH, Weinheim, vol. 1 and 2.</i></p> <p><i>Lankenau D-H, Volff J-N (eds.), 2009. Transposons and the Dynamic Genome. Springer, Dordrecht.</i></p> |
| Supplementary | <p><i>The Arabidopsis Genome Initiative, 2000. Analysis of the genome sequence of the flowering plant Arabidopsis thaliana. Nature 408: 796-815.</i></p> <p><i>Varshney RK, Tuberosa R (eds.), 2007. Genomics-Assisted Crop Improvement. Springer, Dordrecht, vol. 1 and 2.</i></p>                                       |

### Structure of learning outcomes

|  |           |
|--|-----------|
| Area of academic study: R – Agricultural, forestry and veterinary sciences | 2 ECTS ** |
| Area of academic study: P – biological sciences                            | 1 ECTS**  |

### Structure of student activity

|               |                              |            |
|---------------|------------------------------|------------|
| Contact hours | 34 hrs.                      | 1.4 ECTS** |
| Including:    | lectures                     | 15 hrs.    |
|               | classes and seminars         | 15 hrs.    |
|               | consultations                | 2 hrs.     |
|               | participation in research    | - hrs.     |
|               | obligatory traineeships      | - hrs.     |
|               | participation in examination | 2 hrs.     |
| e-learning    | - hrs.                       | - ECTS**   |

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|                  |         |            |
|------------------|---------|------------|
| student own work | 41 hrs. | 1.6 ECTS** |
|------------------|---------|------------|

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\*Areas of academic study in the fields of: H- humanities; S - social studies; P – biological sciences; T – technological sciences; M- medical, sport and health sciences; R – Agricultural, forestry and veterinary sciences; A – the arts

\*\* stated with an accuracy to 0.1 ECTS, where 1 ECTS = 25 - 30 hours of classes