**fişa disciplinei COMPUSI NATURALI CU APLICATII INDUSTRIALE**

**1. Data about program**

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| 1.1 Institution | Babes-Bolyai University, Cluj-Napoca |
| 1.2 Faculty | Chemistry and Chemical Engineering |
| 1.3 Department | Chemistry |
| 1.4 Studies domain | Chemistry |
| 1.5 Studies cycle | Doctoral |
| 1.6 Studies program/Qualification | Chemistry/Doctoral School |

**2. Data about discipline**

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| 2.1 Name of discipline | | | Natural compounds with industrial applications SDC-19-06 | | | | | | |
| 2.2 Appointed for lecture | | | | | Prof. Dr. Ing. Habil. Luminiţa David | | | | |
| 2.3 Appointed person for seminar | | | | | Prof. Dr. Ing. Habil. Luminiţa David | | | | |
| 2.4 Year of study | I | 2.5 Semester | | 2 | | 2.6. Type of evaluation | E | 2.7 Discipline regime | Ob |

**3. Total time estimated** (hours per semester, didactic activities)

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| 3.1 Hours per week | 2 | | Of which: 3.2 lecture | | 1 | 3.3 seminar | 1 |
| 3.4 Total hours from plan of studies | 24 | | Of which: 3.5 lecture | | 12 | 3.6 seminar | 12 |
| Distribution of time: | | | | | | | ore |
| Studies upon manual, lecture support, bibliography and personal notes | | | | | | | 45 |
| Supplementary documentation in library or on specialized websites | | | | | | | 95 |
| Preparation of seminars/ themes, reports, essays | | | | | | | 80 |
| Tutorial activities | | | | | | | 3 |
| Exams | | | | | | | 3 |
| Other activities: .................. | | | | | | | - |
| 3.7 Total hours of individual study | | 226 | |
| 3.8 Total hours per semester | | 250 | |
| 3.9 Number of credit points | | 10 | |

**4. Preliminary conditions** (where applied)

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| 4.1 of curricula | * No need |
| 4.2 of competencies | * No need |

**5. Conditions** (where applied)

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| 5.1 For lecture | * The mobile phones should be off during the lecture * No delay is permitted |
| 5.2 For seminar /practical work | * The mobile phones should be off during the seminar * Este interzis accesul cu mâncare în laborator / la seminar |

**6. Specific competences aquired**

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| **Professional competences** | * Definition of basic notions, concepts, theories and models in the field of natural compounds and their appropriate use in professional communication * Using basic knowledge in the field of natural compounds to explain and interpret their properties * Identification and application of concepts, methods and theories for solving problems typical of the chemistry of natural compounds in conditions of qualified assistance |
| **Crosswise competences** | * Execution of the requested tasks within the specified time frame, in compliance with the norms of professional ethics * Stimulating interpersonal communication and teamwork * Permanent information and documentation in the field of activity |

**7. Specific objectives** (pointed out from the acquired competences)

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| 7.1 General objective | * Acquiring fundamental theoretical knowledge regarding the main classes of natural compounds and their industrial applications |
| 7.2 Specific objectives | * Knowledge of techniques for isolation, purification and analysis of natural compounds * Acquiring basic theoretical knowledge from the chemistry of natural compounds to understand the correlation between their structure and their industrial applications |

**8. Content**

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| 8.1 Lecture | Teaching methods | Remarks |
| 8.1.1-2. Natural compounds with industrial applications: sources, isolation, purification and analysis methods | Lecture; Explanation;  Conversation; Description; Problematization;  Debate | 2h |
| 8.1.3. Carotenoids: classification, properties, industrial applications | Lecture; Explanation;  Conversation; Description; Problematization;  Debate | 1h |
| 8.1.4. Polisaccharides: classification, properties, industrial applications | Lecture; Explanation;  Conversation; Description; Problematization;  Debate | 1h |
| 8.1.5-6. Flavonoids: classification, properties, industrial applications | Lecture; Explanation;  Conversation; Description; Problematization;  Debate | 2h |
| 8.1.7-8. Enzymes: classification, properties, industrial applications | Lecture; Explanation;  Conversation; Description; Problematization;  Debate | 2h |
| 8.1.9. Tannins: classification, properties, industrial applications | Lecture; Explanation;  Conversation; Description; Problematization;  Debate | 1h |
| 8.1.10. Essential oils: composition, properties, industrial applications | Lecture; Explanation;  Conversation; Description; Problematization;  Debate | 1h |
| 8.1.11-12. Other natural compounds with industrial applications (monoterpenes, eugenol, lactoferrin, chlorophyll, betalain) | Lecture; Explanation;  Conversation; Description; Problematization;  Debate | 2h |
| References   1. S.V.Bhat, B.A.Nagasampagi, M.Sivakumar, “Chemistry of natural products”, 2005, Ed. Springer, Berlin 2. “Herbs, spices and medicinal plants: processing, health benefits and safety”, N.P.Brunton, M.B.Hossain, D.K.Rai (Eds.), 2020, Ed. Wiley-Blackwell 3. Scientific articles from specific journals | | |
| 8.2 Seminar | Teaching methods | Remarks |
| 8.2.1. Carotenoids: properties, industrial applications | Explanation;  Conversation; Problematization;  Debate | Seminar will be organized as 6 meetings of 2 hours each |
| 8.2.2. Polisaccharides: properties, industrial applications | Explanation;  Conversation; Problematization;  Debate |  |
| 8.2.3. Flavonoids: properties, industrial applications | Explanation;  Conversation; Problematization;  Debate |  |
| 8.2.4. Enzymes: properties, industrial applications | Explanation;  Conversation; Problematization;  Debate |  |
| 8.2.5. Tannins: properties, industrial applications | Explanation;  Conversation; Problematization;  Debate |  |
| 8.2.6. Other natural compounds with industrial applications | Explanation;  Conversation; Problematization;  Debate |  |
| References   1. S.V.Bhat, B.A.Nagasampagi, M.Sivakumar, “Chemistry of natural products”, 2005, Ed. Springer 2. “Herbs, spices and medicinal plants: processing, health benefits and safety”, N.P.Brunton, M.B.Hossain, D.K.Rai (Eds.), 2020, Ed. Wiley-Blackwell 3. Scientific articles from specific journals | | |

**9. Relationship between the content of the specific discipline with the requirements of the epistemic community, professional associations and potential employers.**

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| * By acquiring the theoretical and applied skills included din the discipline “Natural compounds with industrial applications”, the students are acquiring consistent knowledge in accordance with competences specified in the Diploma Supplement and the potential jobs from ANC. |

**10. Evaluation**

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| Type of activity | 10.1 Evaluation criteria | 10.2 Evaluation methods | 10.3 Contribution to the final mark |
| 10.4 Lecture | Accuracy of the answers –aquiring and understanding of the issues presented during the lectures | Colloquim | 80 % |
| 10.5 Seminar | Accuracy of the answers –aquiring and understanding of the issues presented during the seminars | The activity carried out at the seminar | 20 % |
| The activity carried out at the seminar |
| Quality of the submitted reports |
| 10.6 Minimum standard of performance | | | |
| * Grade 5 (five) in the exam according to the scale. * Knowledge of the main classes of natural compounds and their industrial applications. | | | |

Date Signature, Signature,

Appointed person for lecture Appointed person for seminar

 

Date of approval in Department Signature,

Head of Doctoral School of Chemistry

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