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| **N.** | **COURSE** | **RESEARCH TOPICS\*** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | Impact of biotechnology on production, safety and protection of sustainable agricultural products (6 h) – S. Salvi, L. Fontanesi, C. Ratti | 6 |  | 6 |  | 6 |  |  | 6 | 6 |  |
| **2** | Geographical information systems (8 h) – D. Torreggiani |  |  |  |  | 8 | 8 |  |  |  |  |
| **3** | Energy efficiency and sustainability of buildings for agriculture and agro-industry (7 h) – A. Barbaresi |  |  |  |  |  | 7 |  |  |  |  |
| **4** | Climate change, agriculture and forest ecosystems: forcings, feedbacks and solutions for adaptation and mitigation (8h) – G. Falsone, M.R. Guerrieri, B. Morandi, F. Ventura | 8 |  | 8 |  |  |  |  |  | 8 | 8 |
| **5** | Food loss (5h) and waste (10h): reduction, management and valorization – T. Gallina Toschi, S. Tappi, L. Vannini, M. Vittuari |  | 15 |  | 15 |  |  | 15 |  |  |  |
| **6** | Insights into animal nutrition and precision feeding (8 h) |  |  |  |  |  |  |  | 8 |  |  |
| **7** | Introduction to spatial analysis and geostatistics for supporting precision agriculture (7 h) – G. Baroni (For the 39th cycle this course is already included in the Statistics course) |  |  |  |  |  |  |  |  |  | 7 |
|  | TOTAL | 14 | 15 | 14 | 15 | 14 | 15 | 15 | 14 | 14 | 15 |

\*Research Topics: 1. Agronomy, Herbaceous Crops, Flowers and Vegetables Systems, Agricultural Genetics and Agricultural Chemistry; 2. International Cooperation and Sustainable Development Policies; 3. Microbial Ecology and Plant Pathology; 4. Agricultural and Food Economics and Policy; 5. Agricultural Entomology; 6. Agricultural Engineering; 7. Food science and biotechnology; 8. Animal Science; 9. Tree Production Systems, Fruit, Forest and Ornamental Trees and Grape; 10. Water-Food-Energy-Sustainable Agriculture Nexus.