

## **EUROPEAN BASIC COURSE ON AEROBIOLOGY - SPECIFICATIONS**

### **1. COURSE RATIONALE**

Aerobiology is the study of airborne biological particles passively transported in the air, and considers their sources, release, dispersion, deposition and impacts. It has many applications including human health (e.g. allergy and the spread of airborne diseases), agriculture (e.g. phytopathology) and phenology. The Basic Courses in Aerobiology has been running since 1993 and was the response to the growing interest in monitoring and modelling airborne particles. It is an interdisciplinary course that would be of interest to workers from a range of different disciplines, such as aerosol physicists, botanists, chemists, climatologists, engineers, epidemiologists, environmental scientists, forensic scientists, meteorologists, microbiologists, mycologists, palynologists, physicians, plant pathologists, statisticians, veterinarians and others [1, 2].

### **2. INTENDED LEARNING OUTCOMES**

By the end of this course students will have:

- An understanding of the science and application of Aerobiology
- An introduction into sampling techniques used in aerobiology
- Knowledge of laboratory techniques used in sample preparation and analysis
- Expertise in identifying selected pollen and fungal spores by light microscopy
- An overview of the relationships between Aerobiology and health

### **3. ASSESSMENT DETAILS**

The course will be assessed by a combination of a written examination (40%), a practical test counting daily slides (30%) and practical pollen and fungal spore identification from type slides (30%). All examinations will take place on the last morning of the course.

The written examination will consist of questions based on the course content, and will include topics such as pollen and fungal spore morphology, phenology, and sampling techniques. The duration of the exam will be 1 hour.

The practical test of counting daily slides will involve examining daily slides from the site where the course is taking place. Students will be expected to count pollen on two slides taken from different times of the year, spring (e.g. early flowering trees) and summer (e.g. grasses and weeds). Duration 1 ½ hours.

The second practical test will comprise the identification of pollen grains and fungal spores from type slides used during the duration of the course. Duration 30 minutes.

## **4. SCIENTIFIC SPECIFICATIONS**

### **4.1: Main core session**

The main core session is on 4-5 days, it must contain lectures, practical exercises and tests. The lectures are on the aerobiology topics:

- Aerobiology
- Aerodynamic and pollen sampling
- Pollen samplers and aeroallergen samplers
- Basic microscopy, optical microscopy, field of view, scanning the slides, sources of error
- Pollen structure and morphology
- Fungal spore structure and morphology
- Practical plant identification and taxonomy
- Pollen development, Biology and Function
- EAN data base, Polleninfo.org
- Health impact of pollen and molds exposure
- Climate change: the effect on airborne pollen concentrations
- Modeling and forecasting techniques in aerobiology
- Basic statistics applied to Aerobiology
- Quality Assurance and Quality Control in aerobiology

The practical exercise of the plenary session will be for the most important airborne pollens and spores in the allergy topic (20 pollens and 4 fungal spores):

- Presentation and adjustment of the microscope.
- Presentation and adjustment of the pollen trap.
- Preparation of the drums and the slides

The plenary session will be finished by an examination on theoretical and practical.  
Presentation of certificates

### **4.2: Optional session**

- Only practical sessions with tests and examination
- Identification up to 20 more pollen and 10 more fungal spores
- Test and examination
- Complementary certificate.

## **5. LOGISTICAL SPECIFICATIONS**

### **5.1: Location**

The basic course must be organized by a member of EAS working in a university or association with a topic in aerobiology. The basic course must be located in a place at less than 2 hours of an international airport. The location of the course, the accommodations of the students and the teachers must be nearly at the same place.

### **5.2: Duration and Time-table**

The basic course may be divided in to two parts:

- Plenary session which must be organized from a Monday morning to Friday afternoon
- Optional session up to 4 days the following week

Social program in 1 or 2 days during the week-end

### **5.3: Accommodations for the course** (15 to 25 participants)

The location for the course must permit enough places for the theoretical courses and the practical exercises. For the theoretical session, the place must be sufficient for the students, their documentations and the teachers. The room must be equipped with video projection and paperboard. The luminosity must be adapted to see the details on the slides projected on the screen.

For the practical exercises, each student must have one optical microscope of good quality. The students must be, if possible, in the same room. One microscope with a camera will be connected to a video projector as a computer. The teachers must be able to present the details of a pollen grain and the different characteristic of this pollen on the CD key of determination.

### **5.4: Accommodations for students**

Students must have single or double rooms with toilets and bathroom in a location near the course location. They must have Wi-Fi connection in the rooms.

### **5.5: Accommodations for teachers**

Teachers must have single room in a hotel or residence not too far from the location of the course. The level of comfort must be > 2\*.

## **6. BUDGET**

The fee for the Basic Course should be in the range of 600-700 euros per person, so that participants from all countries can attend. The fee should include the following:

- Teaching facilities - Teaching technical staff
- Subsistence and accommodation for participants
- Travel for visiting lecturers
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- Supported places–It is recommended that the Basic Course should offer a number of grants for participants.
- Printing, preparation notes and reagents
- Excursion – One excursion on the last afternoon of the course
- End of course dinner

## **REFERENCES**

1. Burge, HA. Aerobiology and Public Health. in 6th International Congress on Aerobiology. Perugia, Italy, 31st August to 5th September. 1998.

2. Galán, C. Aerobiology, A Multidisciplinary Science. in Database, Quality Control and Statistics in Aerobiology Workshop. Adam Mickiewicz University, Poznan, Poland 21-24 April. 2006.
3. Galán, C., M. Smith, M. Thibaudon, G. Frenguelli, J. Oteros, R. Gehrig, U. Berger, B. Clot, R. Brandao, EAS QC Working Group. Pollen monitoring: minimum requirements and reproducibility of analysis. *Aerobiologia*, 2014, 30:385–395.
4. Galán C., A. Ariatti, M. Bonini, B. Clot, B. Crouzy, A. Dahl, D. Fernandez-Gonzaález, G. Frenguelli, R. Gehrig, S. Isard, E. Levetin, D.W.Li, P. Mandrioli, C. A. Rogers, M. Thibaudon, I. Sauliene, C. Skjoth, M. Smith, M. Sofiev. Recommended terminology for aerobiological studies. *Aerobiologia*, 2017. 33:293– 295.