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PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Proposal on the infrastructure outline of the Distributed European School of Taxonomy DEST



This proposal has been widely distributed to EDIT and non-EDIT partners for comments. At the moment of this report, feedback results are processed and will be discussed in a forthcoming meeting.

1. RATIONALE

European science is facing a tremendous loss of taxonomic expertise as the succession of retiring qualified taxonomists is hampered by reorientation of work and by cuts in staff. Consequently, the transfer of taxonomic knowledge and skills to a new generation is decreasing. In order to overcome the loss of expertise, the fragmentation of educational resources needs to be tackled both in terms of structure and content. Another difficulty is the lack of awareness of training offer.

Currently, taxonomic training is delivered in disparate and diffuse ways across countries in Europe, and across educational structures within countries. Moreover, taxonomy is taught at a number of levels and for a range of purposes: the training may be formal involving undergraduate or post-graduate university courses, or it can take the form of modules in wider courses, short courses, in-house seminars, field courses or on-the-job training.

Despite the wide-ranging specificities, there are common grounds across institutions, which suggest that a more coherent framework can be established. This integrated framework can be developed to incorporate a wide range of partners, starting with EDIT partners then reaching to taxonomic institutions, universities, research centres and international organisations outside the EDIT Consortium.

The integration of EDIT's education and training activities into the wider international context provides a crucial contribution to the Global Taxonomy Initiative's capacity building activities, since many countries worldwide are in desperate need of taxonomists. A proportion of EDIT's training and financial opportunities will be reserved specifically for students from developing countries.

2. OBJECTIVES

EDIT partner institutions and non-EDIT partner institutions will establish a European state-of-the-art School of Taxonomy, the **Distributed European School of Taxonomy (DEST)**, with the aim to develop an inter-institutional programme in Taxonomy. The participating institutions will be among the leading ones in the field of Taxonomy. High-level education and knowledge sharing are fundamental prerequisites in the development of future generations of taxonomists in Europe and beyond. The programme is intended to be offered to European and non-European trainees.

Federating the best EDIT can offer in teaching 'Taxonomy' is a positive effect if it can deliver this knowledge to everybody who is seeking it. To organise the knowledge in the field of taxonomy is one of the objectives of DEST. To develop an efficient environment to support the courses given

by distributed teachers to distributed students will also be an important factor for the success of the developed study programmes.

3. INTEGRATION AND COOPERATION (FIG. 1)

The main idea of a common course development is to share and to jointly further develop the knowledge in the field of taxonomy. During the first phase of the set up of the School, a survey has been conducted to inventory the existing training resources for taxonomy. A gap analysis revealed strengths and weaknesses of the current training offer in taxonomy in Europe and highlighted the challenges that these training courses have to face in order to meet the standards and needs of the 'twenty-first century' taxonomy. This exercise was needed to implement the overall objective of WP 8: establishing a European state-of-the-art school of taxonomy. A summary of this report can be found at http://e-taxonomy.eu/files/C_8.1.2_gap_analysis.pdf and a listing of existing training resources for taxonomy in Europe at: <http://www.e-taxonomy.eu/trainingresources/> Furthermore, by means of a call for training providers, teachers willing to participate in the DEST were mobilised. The result is represented in Annex 'Result call'.

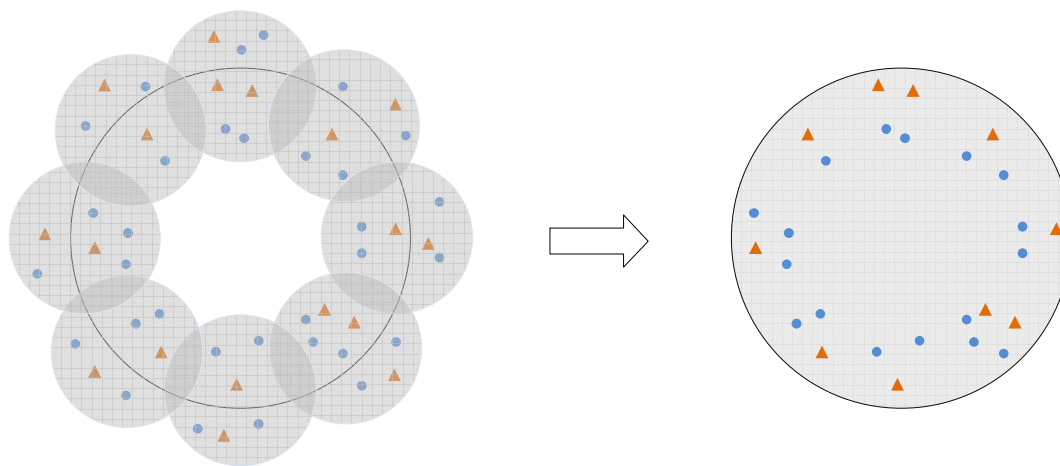


Fig. 1 Federation of multiple taxonomy courses into the DEST. Triangles represent teachers, small circles represent students, middle circles represent partner institutions, and the big circles represent the common course programme and the DEST.

The curriculum of the DEST will be developed in such a way that courses will be offered at several institutions. In this way the courses will give the best quality that partners can offer considering their staff, experiences and equipment. Each partner institution will contribute with a different number of subjects depending on the matching between the curriculum topics and the existing expertise of each institution. The trainee will attend the course subjects in different ways: face-to-face at the institutions and where appropriate by means of e-learning.

Students will register in the DEST and study the course units offered at the different institutions through the modes of delivery prevailing at the institution. Visiting other institutions will provide them with a flexible and interesting learning experience. In addition, the trainee will have the opportunity to do a training on-the-job offered by the partner institutions.

4. COMPONENTS OF THE DEST (FIG. 2)

Following components will make part of the DEST (model for discussion):

- Course programme ‘Modern Taxonomy’
- Expert-in-training programme
- Summer School

Training via course units (=course programme) will be complemented by a system of expert-in-training within current research projects and by yearly held summer schools.



Fig. 2 Components of the Distributed European School of Taxonomy

4.1 Course programme

The course programme will be developed with the purpose that the trainee will not only get the best course subject the partner institutions can offer in a specific taxonomic area but he will also get the important experience of other universities, countries and cultures. The DEST will federate training providers around a common vision for the future of taxonomic training in Europe. It will bring together existing training resources and new training opportunities into a coherent and widely publicised training programme for taxonomy.

4.2 Expert-in-training programme

The expert-in-training programme was launched in June 2008. EDIT will provide a limited number of short-term traineeships in the field of taxonomy. In the first call, the traineeships are offered in an EDIT institution for trainees affiliated to an EDIT institution. The intention is to involve non-EDIT partners in the training offer and to open the traineeships to non-EDIT partners in subsequent calls. It will give a cogent visibility to the European potential of taxonomy resources.

<http://www.e-taxonomy.eu/node/60>

The main objective of the expert-in-training programme is to provide young graduate students and early career researchers with an opportunity to acquire and to strengthen research skills through an on-the-job training. The trainee will join a project team and will be coached by an expert (mentor) who will instruct him/her on ‘how to do the job’. Other objectives of the programme are to encourage mobility, to promote integration by establishing new contacts with other researchers in their own and related fields and to contribute to building capacities in his/her institution.

4.3 Summer School

The Summer School is an initiative of WP 7 ('Applying taxonomy to Conservation') and WP 8 ('Training and Public Awareness'). The Summer School will be held yearly in an ATBI+M pilot site and will be integrated as a permanent component of the DEST.

The purpose of the Summer School 'Modern Taxonomy and Field Work' is to train students in 'Best Practice' of field sampling and various aspects of taxonomic research in biodiversity studies and conservation biology. The Summer School will provide practical taxonomic experience combined with theory lectures to give an in-depth understanding of the current state of taxonomic research and its broad applicability in other scientific disciplines and non-scientific initiatives.

<http://www.atbi.eu/summerschool>

The Summer School is open to students who have recently finished their MSc level or who are in an early stage of their PhD research in a biological discipline. The first Summer School will be held in the late summer of 2008 (31/08-14/09), jointly with the ongoing 'All Taxa Biodiversity Inventory and Monitoring (ATBI+M)' in the French/Italian Alpine nature reserves of Mercantour and Alpi Marittime. ATBI+M activities are part of a global research effort to document spatio-temporal dynamics in biodiversity of conservation priority areas.

The Summer School provides a unique chance for students to meet with professional taxonomists and experience firsthand the challenges and rewards of field work in the inspirational settings of the Maritime Alps.

5. STRUCTURE OUTLINE OF THE COURSE PROGRAMME 'MODERN TAXONOMY' (FIG. 3)

The taxonomy course programme will comprise:

- Taxonomy core courses module
- Supplementary taxonomy courses module.

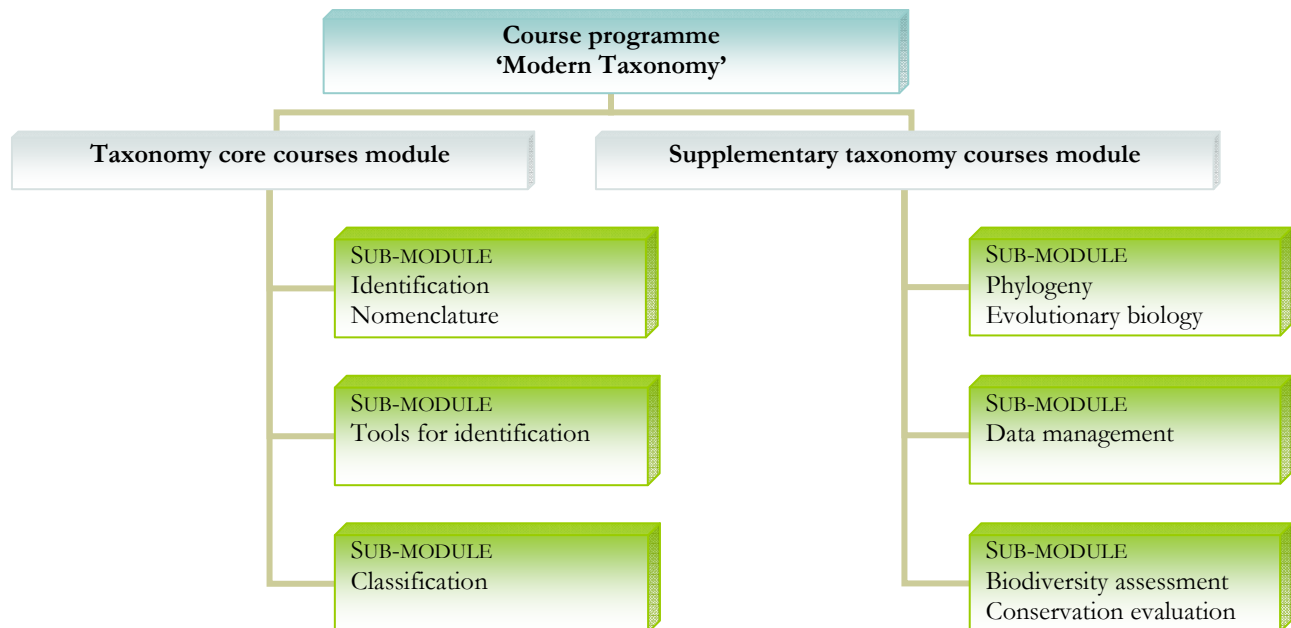


Fig. 3 Content of the course programme 'Modern Taxonomy'

5.1 Taxonomy core courses module (Fig. 3-4)

The Taxonomy core courses module will consist of x units (subjects). These teaching units will be developed and delivered jointly by the partners.

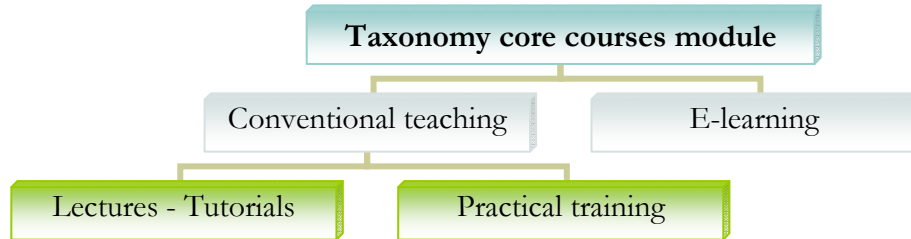


Fig. 4 Outline of Taxonomy core courses module

For each teaching unit a responsible partner will be assigned to coordinate the development of the content and of the teaching material. Teaching material will be prepared in conventional form (lectures, practicals) and, where appropriate, in distance learning form.

The Taxonomy core courses module will be offered as a new study programme with the ultimate purpose to be included in existing teaching programmes at universities as part of an undergraduate programme. Integration at this education level emphasises the fundamental importance of taxonomy in the formation of future biologists. Moreover, it paves the way for motivating or preparing students for their future taxonomic dissertation or career in taxonomy.

5.1.1 Content of the Taxonomy core courses module (Fig. 3)

A diversity of approaches exists to provide teaching and training in Taxonomy with universities/institutions offering courses in pure and applied taxonomy but there are few dedicated training courses that equip future experts with a profound knowledge on **basic taxonomy** (see report on gap analysis).

The module will consist of lectures, tutorials and practical work covering the following major areas:

- Identification
- Nomenclature
- Tools for identification
- Classification

Content of the module and lectures will be defined in mutual agreement with the training providers.

5.1.2 Integration of the ‘Taxonomy core courses module’ in current university curricula: the challenge

The overall objective of the ‘Taxonomy core courses module’ is to develop an international multi-institutional course programme which is the result of joined taxonomy knowledge and human forces present in museums and other research institutions. The ultimate goal is to integrate the module as an optional course programme in current university curricula. At a first stage, this Taxonomy core courses module will be offered to EDIT Member States for integration in university curricula. At a further stage, the programme would be presented to all 27 Member States.

'Reforming' university curricula and obtaining approval and recognition by universities to run the Taxonomy core courses module will not be easy. Therefore, the importance and relevance of a sound taxonomy training to underpin the skills and scientific formation of biology students should be more emphasised and unequivocally demonstrated.

Specific arrangements need to be worked out for those interested trainees who are not enrolled in a university.

5.2 Supplementary taxonomy courses module (Fig. 3)

The Supplementary taxonomy courses module will treat taxonomy in a broader sense. These teaching units will be delivered by training providers who have expressed their will to participate in the DEST (*cf.* 'Call to training providers') and by trainers who contacted EDIT WP 8 by other means. The result of this call with a list of courses and providers is presented in Annex 'Result call'. A selection will be made out of this list.

The supplementary courses will cover the following major areas:

- Phylogeny
- Evolutionary biology
- Data management
- Biodiversity assessment
- Conservation evaluation

6. E-LEARNING COMPONENT: THE VIRTUAL DEST CAMPUS

The main goal of this virtual component of the DEST is to improve the teaching and learning methods and skills with a special focus on ODL-technologies (Open & Distance Learning). It is a location in cyberspace designed to support the Taxonomy training, to facilitate resource sharing, collaborative and integrated teaching and learning.

The site will have four components:

1. **information centre** (open access) general info, news, etc.
2. **learning zone** (restricted): course units, tutorial support, dialogues, assessments etc.
3. **resource centre** (open access): list of courseware, virtual library, links to databases and taxonomic networks, software, etc.
4. **communication zone** (restricted access): for teachers and students - exchange of material and experiences

The efforts will focus on creating an environment for optimal support of distributed learning and on designing a system that allows gradual development, first covering the Taxonomy training, and later evolving into a 'Virtual DEST Campus'.

7. ORGANISATIONAL STRUCTURE OF DEST (FIG. 5)

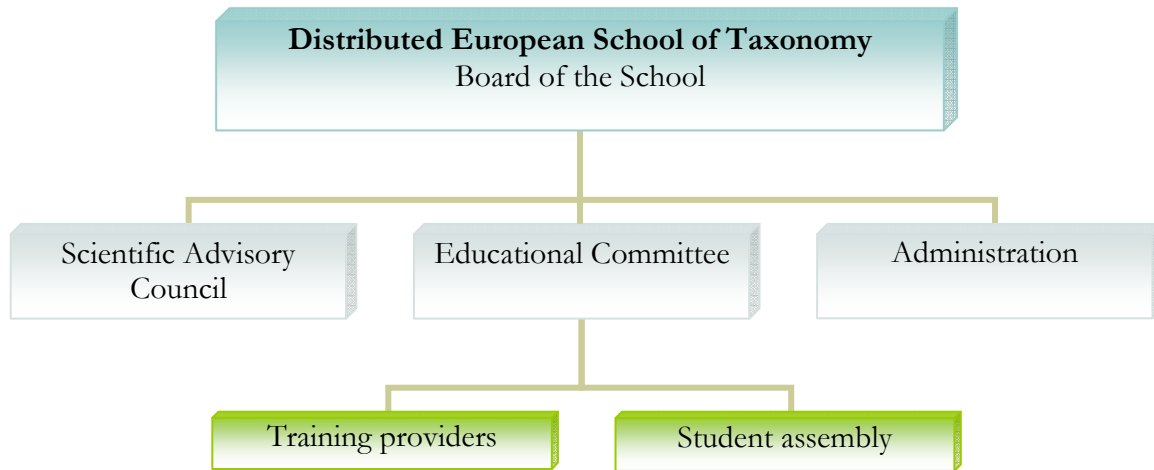


Fig. 5 Organisational structure of DEST

Board of the School (BoS)

The Board of the School decides on the general policy and curriculum of the DEST. The board consists of representatives of the participating institutions. The board is chaired by one of the members.

Scientific Advisory Council (SAC):

The SAC of EDIT will be the consultative body charged with the scientific evaluation of DEST's training activities. The EDIT SAC is composed of scientist experts from outside the Consortium and any other specialists in the field of the Project, stakeholders and users. It will give advice to the Educational Committee, the Board of the School and the EDIT Board of Directors (BoD) on the teaching priorities and orientation and on the curriculum.

Educational Committee (EC)

The EC is composed of training providers of the participating institutions. It is charged with the set-up of the DEST. It will develop the DEST curriculum including the content of the training programmes, process for student participation, recognition and accreditation of courses, e-learning resources, general principles of integration of the training units, etc. Their proposals will be submitted to the Board of the School, SAC and BoD for approval. The chair of EC is responsible for coordinating the teaching activities and for maintaining the contacts with the Board of the School on the one hand, and the Council and Committee on the other. The Board of the School together with the SAC and EC are responsible for taking care that quality of the DEST is maintained and improved.

ISSUES OF THE PRESENT PROPOSAL TO BE DISCUSSED

1. **General structure of DEST: model and components**

Comments/suggestions and agreement on the different components of DEST

- Course programme
 - Taxonomy core courses module
 - Supplementary taxonomy courses module
- Expert-in-training programme
- Summer School

2. **Course programme of DEST (Taxonomy core courses module + Supplementary taxonomy courses module)**

2.1 **Possible structure and content of the Taxonomy core courses module:**

As outlined in the DEST document, course units of the module will be offered in more than one institution: several partners will provide a course unit. Ultimate goal is to offer this module to universities as an optional course unit in their current curriculum.

- define course units
- define course content
- selection of training providers
- who will be the responsible partner institutions
- level of training: undergraduate programme
- integration of the module in university curricula:
 - location: distributed in different institutions/universities
 - integration of the subject units in time schedules of the participating universities: time schedule of module has to be convenient for the trainee – any suggestions?
 - integration of the taxonomy module in the Credit Point System of the institutions - suggestions?
- remaining audience: technicians, non-professionals, other interested persons: a specific arrangement needs to be worked out with the institution/university providing the course(s) for those trainees who are not enrolled
- other discussion points?

2.2 **Possible content of the Supplementary taxonomy courses module**

Module will be offered by various institutions (selection from result call to training providers + other courses being offered by EDIT partners and non-EDIT partners.

- participation of the various partners (training providers) providing components of the Module
- location: distributed in different institutions/universities
- target audience: anyone who wants to broaden/strengthen her/his taxonomic background: courses will be offered for all levels (students, technicians, non-professionals etc.) and will be open to European and non-European students
- other discussion points?

- 3. Expert-in-training programme**
During the first call 21 proposals for a training-on-the job in EDIT institutions are offered to trainees affiliated to an EDIT partner institution. It will be open in subsequent calls for non-EDIT partners as well. This programme will be integrated as a permanent component of DEST.
- 4. Summer School**
The EDIT Summer School is an initiative of WP 8 (“Training and Public Awareness”) and WP 7 (“Applying taxonomy to Conservation”). The Summer School will be held yearly in an ATBI+M pilot site and will be integrated as a permanent component into DEST.
- 5. Development of e-learning facilities**
- 6. Participation of students/trainees**
Registration/acceptance of students/trainees: will be different depending on the training component to follow.
Summer School and Expert-in-training programme have their specific guidelines and selection criteria.
- 7. Organisational structure of the DEST**
Agreement or comments on the proposed structure as outlined in the DEST proposal.
- 8. Others**

ANNEX 'Result call'**(data collected in 2007)**

Result of call to training providers willing to participate in DEST				
Europe	teaching given	teaching at present	like to contribute in	training provider
Zoology specialists				
Specific groups				
Herpetology: identification	Practical course: use of determination keys on african snakes	none	class/e-learning/hands-on	Meirte, RMCA; spec. Reptilia
Chordata, Pisces: morphology, systematics, biodiversity	Ichthyology, taxonomy, morphometrics and data analyses, chordate systematics and morphology	Biodiversity of chordates Comparative and functional anatomy of chordates Systematics of fishes Systematics of African fishes	class/e-learning/hands-on	Snoeks, RMCA-KUL; spec. Ichthyology; training team in RMCA (FishBase and Fish taxonomy training programme)
Crustacea: faunistics, biogeography, population biology	Faunistics, distribution, biogeography, population biology of decapod and stomatopod crustaceans	none	not spec.	Abello, Institut de Ciències del Mar (CSIC); spec. Decapoda, Stomatopoda
Copepoda: taxonomy	Taxonomy of freshwater Copepoda	none	hands-on	Holynska, Museum and Institute of Zoology PAS; spec. Copepoda
Acari: morphology	Acarology: morphology and evolutionary morphology in Oribatida	none	class	Wauthy, RBINS, spec. Acari
Lepidoptera: α -taxonomy	Taxonomy of Lepidoptera	none	class/hands-on (field)	Tarmann, Tiroler Landesmuseum, Innsbruck; spec. Zygaenidae
Invertebrates: α -taxonomy, Bioindicators	Sampling of invertebrates, biodiversity risks, biodiversity monitoring	Course in the Taxonomical Identification of Terrestrial Invertebrates: Bioindicators of Biodiversity"	class/e-learning/hands-on	Corazza, Museum of Natural History of Ferrara; spec. Invertebrata
Invertebrata - Acari: taxonomy, ecology	Evolution of Chelicerata, limnology, acarology	Springs as habitats of invertebrate animals; invertebrates in and near the shores of lake Federsee; introduction to the study of water mites	class	Gerecke, Univ. Tübingen; spec. water mites

Invertebrates (Insects): Taxonomy, Ecology	Taxonomy and ecology of invertebrates	none	e-learning/hands-on	Karaman, Natural History Museum of Montenegro; spec. Formicidae
Invertebrates, insects taxonomy, systematics, phylogeny	Taxonomy of invertebrates and insects	Diversity and evolution of invertebrates Phylogeny and classification of insects Paleoentomology [in Polish]	class/hands-on	Szadwiewski, University of Gdańsk; spec. Ceratophgonidae (fossil)
Invertebrata - Chironomidae: α -taxonomy, morphology, ecology	Chironomidae (larvae, pupal exuviae), aquatic macroinvertebrates (all groups)	Identification of Chironomidae: Larvae and pupal exuviae. Aquatic macroinvertebrates. Identification of indigenous water organisms. Introduction to the identification of water organisms . Biology, morphology and ecology of non biting midges (Chironomidae) and study methods.	class	Orendt, Water Assessment, Leipzig; spec. aquatic macroinvertebrates, Chironomidae (SME= tutor fee)
Diptera: Taxonomy, biogeography, biodiversity	Lectures on Diptera in General Entomology university courses	none	not spec	Cerretti, Centro Nazionale Biodiversità Forestale, Corpo Forestale dello Stato, Verona; spec. Diptera, Tachinidae, Rhinophoridae
Orthoptera: α -taxonomy, bioacoustics	Orthoptera (Insecta), Bioacoustics, Taxonomy, Collecting methods	none	class/hands-on/e-learning	Buzzetti, Univ. Padova; spec. Orthoptera, Heteroptera
Orthoptera: α -taxonomy, ecology, bioacoustics	Orthoptera taxonomy, ecology, biogeography, bioacoustics	none	class/hands-on/e-learning	Fontana, Univ Padova; spec. Orthoptera
Syrphidae: α -taxonomy, bioindicators	Syrphidae Taxonomy The use of insect as bioindicators	Syrphidae Taxonomy	class/hands-on/e-learning	Sommagio; University of Bologna; spec. Diptera
Hymenoptera: Phylogeny, α -taxonomy, flower ecology	Taxonomy and phylogeny of Hymenoptera, esp. Braconidae. Flower ecology (in relations to insects and their morphology)	Taxonomy and phylogeny of Hymenoptera, esp. Braconidae. Flower ecology. Collections and identification (e.g. constructing keys)	class/hands-on/e-learning	Achterberg; Nationaal Natuurhistorisch Museum (Naturalis); spec. Hymenoptera

Entomology: chemical ecology, α -taxonomy sawflies	Chemical ecology of insects	None	classroom	Boevé, RBINS; spec. Hymenoptera, Symphyta
Entomology - Taxonomy, biodiversity; urban pests	Identification of Urban Pests. Insect biodiversity in the tropics	Identification of Urban Pests; Insect biodiversity in the tropics	class/e- learning/hands- on	Grootaert, RBINS; spec. Diptera, Empidoidea
Culicidae - Simuliidae: biology, ecology, biological control	Biology and ecology, and biological control of mosquitoes and simuliids	none	hands-on	Wegner, Museum and Institute of Zoology PAS; spec. Culicidae
Coleoptera: systematics, evolution ICZN	Systematics and evolution of Coleoptera Curculionoidea Zoological Nomenclature (ICZN member)	Curso teórico-práctico de nomenclatura zoológica	class/hands-on	Alonso-Zarazaga, Museo Nacional de Ciencias Naturales (CSIC); spec. Curculionidae
Rotifera: α - taxonomy, biogeography ICZN	Taxonomy and Biogeography of Rotifera, General Biogeography, Int. Codes of Nomenclature	Taxonomy and Biogeography of Rotifera What's in a name: the ICZN	class/e- learning/hands- on	Segers, RBINS; spec. Rotifera
Nematology: morphology, systematics, molecular phylogeny, α - taxonomy	Nematology, morphology, systematics, plant-parasitic nematodes	General Morphology Nematode systematics and molecular phylogeny Identification of plant-parasitic nematodes Capita Selecta	classroom+e- learning	Decraemer, RBINS + Gent University (MSc courses); spec. plant-parasitic Nematoda
Platyhelminthes: taxonomy	Taxonomy of free-living Platyhelminthes	none		Norena, Museo Nacional Ciencias Naturales, Madrid (CSIC); spec. Platyhelminthes
Mollusca	Molluscs, Bivalves, Freshwater	none	class/e- learning/hands- on	Araujo, Museo Nacional de Ciencias Naturales; spec. freshwater Mollusca

Taxonomy Arthropoda, anatomy	Animal (mainly arthropod) taxonomy courses; animal anatomy courses; introducing courses to field biology methods (all in HU biology basic schedule before 2000)	none	not spec	Büche, Humboldt Univ. (freelance) ; spec. Coleoptera, Heteroptera
Protozoa	Parasitology, protozoology, molecular biology	“Medical Parasitology”, “Molecular Parasitology”, “Parasitologic Diagnostics”	classroom/e-learning	Walochnik, Med. Univ. Vienna; spec. Protozoan pathogens (morph. + molec.)
Morphology invertebrates, ecology, biodiversity meiofauna-plankton	Diversity of meiofauna and plankton Ecology of the intertidal Functional morphology of Invertebrates	Diversity of meiofauna and plankton Ecology of the intertidal Functional morphology of Invertebrates	e-learning/hands-on	Schmidt-Rhaesa, ZM of Univ Hamburg; spec. Nematomorpha, Gastrotricha, Kinoryncha
Specified as discipline				
Entomology - Biodiversity conservation		Entomology Biodiversity Conservation	class/hands-on/e-learning	Mason (contact), Ministry of Agriculture and Forestry - National Forest Service CNBF - National Centre for Study and Conservation of Forest Biodiversity ; Verona
Entomology - Biodiversity, Conservation	Biodiversity and nature conservation	None	class/e-learning/hands-on	Pollet, IWT; spec. Diptera, Dolichopodidae
Entomology: systematics, phylogeny, biogeography	Entomology, phylogeny, biogeography	Systematics and Evolution Fisheries	class/e-learning	Patiny, Gembloux; spec. Hymenoptera
Entomology: general, zoogeography, biodiversity	General entomology, zoogeography, biodiversity	Entomologia, Entomologia applicata	not spec	Vigna Taglianti, Univ Rome- spec. Carabidae, Dermaptera
Entomology, Environmental management	Entomology, environment-management	none	hands-on	Holynski, freelance, Poland; spec. Buprestidae

Taxonomy-entomology, Ecology	Ecology	Ecology I, II; Agroecology; Human Ecology I, II, III; Insect identification; Biology of spiders	class	Nentwig, Community Ecology, Zoological Institute, University of Bern; spec. Spiders & Insects
Phylogeny	Phylogenetic Analysis of Proteins and DNA	“Current methods of cladistic analysis”	class/hands-on	Sadowski-Woda, University of Rzeszow Department of Biochemistry & Cell Biology; spec. Heteroptera
Geometric morphometrics, evolution	Geometric morphometrics – Evolution – Environmental education	none	class/e-learning/hands-on	Van Daele, UG, spec. Rodentia (phylogeny, karyology)
Systematics, Phylogeny, Biodiversity, population genetics	Systematics, Population genetics, Molecular phylogenetics, Biodiversity sciences	none	class/hands-on/e-learning	Schilthuizen, National Museum of Natural History ‘Naturalis’; spec. malacology, entomology
Molecular phylogeny	Molecular phylogeny	none	class/hands-on	Verheyen, RBINS; spec. Molecular phylogeny, systematics (Rodentia, Pisces)
Systematics, taxonomy, paleontology	Systematics, taxonomy, paleontology	Bases de la taxonomie Qu’est ce que la phylogenetique ? Paleontologie evolutive : Histoire des idees Phylogenie des Mammalia	class	Tassy, MNHN Paris; spec. Phylogeny Mammalia
Biodiversity	Bioacoustics, Tropical biology	Introduction to Biodiversity research; Biodiversity loss.(Part of Interdisciplinary doctoral program at the Center for Development Research, Bonn, www.zef.de)	class/hands-on/e-learning	Riede, Bonn; spec. Orthoptera, Cicadidae
Zoology, Ecology, Biogeography, Entomology	Zoology, Ecology, Biogeography, Entomology Ecology of territorial system Distribution types of Lepidoptera in Southern Italy The impact of human activities on animal communities	none	class/hands-on/e-learning	Scalercio, CRA Centro di Ricerca per l’Olivicoltura e l’Industria Olearia, Rende; spec. Lepidoptera
Zoogeography		Zoogeography	e-learning/hands-on	Mazzotti, MNH, Ferrara, spec. Amphibia, Reptilia, Micro-mammalia

Taxonomy, project management, bioinformatics	Informal teaching in taxonomy, in project management, in use of informatic tools (bibliographic research, sequencing, taxonomy, cladistic analysis)	none	e-learning/hands-on	Braet, coll. RBINS; spec. Hymenoptera, Braconidae
Zoology, Ecology, ethology	Evolution, zoology, ethology, zoogeography	Evolutionary zoology, ethology, zoology applied to cultural beings	e-learning	Belmonte, Uuniveristy of Salento, Lecce; spec. zooplankton-copepoda
α -taxonomy, phylogeny, bioinformatics	Basic zoology classes, seminars on biogeography, courses on histological techniques, excursions to the Mediterranean	none but interestd in teaching digital drawing, key constructions, description, phylogenetic analyses (nEXUS, DELTA, PAUP etc)	hands-on	Coleman, Humboldt Univ.; spec. Amphipoda
Systematics, Zoogeography	Systematics, Zoogeography	“Zoogeography”	class/hands-on/e-learning	Taiti, Istituto per lo Studio degli Ecosistemi - CNR, Florence + Univ Florence; spec. Isopoda
Systematics, Taxonomy, Biodiversity	Taxonomy and systematics	Analyzing biodiversity and life history (PhD, postdoc level)	class/hands-on	Obst, Kristineberg Marine Research Station Sweden; spec. Bryozoa
Zoology, Ecology	Zoology, Taxonomy, Environmental indicators at the community level	Zoology, Environmental indicators (practical courses)	class/hands-on	Manconi, Dipartimento di Zoologia e genetica evoluzionistica, Univ. Sassari; spec. Porifera
Marine Paleo/Biology, Ecology	Marine Biology and Ecology	Marine Biology and Ecology	class/hands-on/e-learning	Marzialetti, ICRAM – Central Institute for Marine Research, Roma + Univ. Camerino; spec macrozoobenthos
Marine ecology	Coastal oceanography and ecology Marine ecology for divers Environmental education	Marine ecology for divers	class/hands-on/e-learning	Trabucco, I.C.R.A.M. Central Institute for Marine Research; spec. Amphipoda
Biology, Macrobenthos, α -taxonomy	Taxonomic determination of taxon Polychaeta, sorting activities and data analysis of macrobenthic fauna within research projects for undergraduate students.	e-learning course in biology science for the Italian open university “Guglielmo Marconi”.	class/hands-on/e-learning	la Porta, I.C.R.A.M. Central Institute for Marine Research; spec. Polychaeta
Environmental education	Environmental education		class/hands-on/e-learning	Bacci, I.C.R.A.M. Central Institute for Marine Research

Biology, Macrobenthos, α -taxonomy	Taxonomic determination of taxa Crustacea, Echinodermata and Mollusca, sorting activities and data analysis of macrobenthic fauna within research projects for undergraduate students.	e-learning course in biology science for the Italian open university "Guglielmo Marconi".	class/hands-on/e-learning	Targusi, I.C.R.A.M. Central Institute for Marine Research, spec. Crustacean Echinodermata, Mollusca
Taxonomy - Marine ecology	Benthic ecology, Annelida Polychaete taxonomy	none	class/hands-on/e-learning	Lanera, ICR soc. Coop., Istituto Cooperativo di Ricerca , Italy; spec. Polychaeta
Marine Ecology	Marine Coastal Ecology	Organisms in their Environment	hands-on	Vonk; Zoological Museum of the University of Amsterdam; spec. fish taxonomy
Marine Ecology	Marine Ecology	Benthic Marine Ecology	hands-on	Martin, Center of Advanced Studies of Blanes (CEAB, CSIC)+ Univ. Barcelona; spec. Polychaeta
Biology, biodiversity, marine ecology	Botany, biodiversity, marine biology Algal identification Plant identification	Introductory Biology Biological Diversity Marine Ecology Marine Processes		Maggs, Queen's University Belfast; spec. algae
Taxonomy, Marine Conservation	Taxonomy. Marine Conservation.	none	e-learning	MacPherson, Centro de Estudios Avanzados de Blanes (CSIC); spec. Decapoda
Taxonomy, marine conservation	Taxonomy. Marine Conservation.	none	e-learning	MacPherson, Centro de Estudios Avanzados de Blanes (CSIC); spec. Decapoda
Fishery, Benthic ecology	Fishing technology, benthic bionomics, zoology.	Fishing technology	e-learning/hands-on	Pipitone, CNR-IAMC - Consiglio Nazionale delle Ricerche, Istituto per l'Ambiente Marino Costiero - Sede di Castellammare, spec. Decapoda
Bioinformatics	Biodiversity Informatics (developments, applications) Capacity Building in BioInformatics (training)	Biodiversity Informatics Course (3 day) Training for data management (flex. program)	e-learning/hands-on	Schalk; ETI BioInformatics

Botany specialists				
Specific groups				
Algae	Botany	The plant kingdom: part algae	class/hands-on/e-learning	Jahne, BGBM, FU Berlin; spec. Algae, diatoms
Fungi	Fungi, tropical mycology, ethnomycology Africa	Introduction in tropical mycology, essentials in collecting, taxonomy, identification and herbarium techniques.	class/hands-on	De Kesel, NBGB; spec. Fungi, ethnomycology
Microbiology	Microbiology and Food Science	Forest Microbiology; Microbiology; Food Hygiene and Safety	class/hands-on/e-learning	Marques, University of Tras-os-Montes e Alto Douro, Vila Real, Portugal; spec. Mycology
Plantae +Fungi	Plant Systematics, Biodiversity	Evolution of Plant Diversity; Creating Revisions, Floras and Monographs; Molecular Systematics; Introductory Botany; Basic Plant Ecology; Advanced Plant Ecology; Conservation and Biodiversity; Botany Research Skills; Diversity and Identification of Plants		Culham, University of Reading; spec. Plant and fungal systematics
Phytoplankton, phytobenthos, quality management	- phytoplankton analyses - sampling and analysis of “remaining phytobenthos” (phytobenthos excl. Charales and diatoms)	Use of phytobenthos for the assessment of running waters according to the Water Framework Directive for regional water management authorities Demonstration of phytobenthos within the course “Methoden der Erfassung der strukturellen und ökologischen Zustands von Fließgewässern” “Makrozoobenthos und Phytobenthos – Erfassung und Bewertung im Rahmen der WRRL”	class/hands-on/e-learning	Dr. Gutowski & Dr. Foerster, Independent office Bremen; spec. algal analysis
Phytoplankton - Algae: taxonomy, diversity	Seaweed identification (hands-on training), Algae taxonomy, Marine Ecology, phytoplankton	Diversity of marine algae Diversity of marine phytoplankton Marine Microbes	class/hands-on	Simon N., Station de Biologique de Roscoff – University Paris 6; spec. Algae
Pteridology, Phylogeny	Pteridology, phylogeny reconstruction	Pteridology (2 days) Introduction to phylogenetic analysis (5 days, with P.C. van Welzen) Advanced topics in phylogenetic reconstruction (5 days)	class/hands-on/e-learning	Hovenkamp; Nationaal Herbarium Nederland – Leiden branch; spec. Pteridology

Phylogeny, taxonomy, nomenclature , bioinformatics	Vascular plant taxonomy, Numerical methods in taxonomy (phenetic studies & evolutionary trees), Nomenclature	(1) Phenetics, cladistics and other methods of phylogeny reconstruction (lectures & practicals)(2) General taxonomy, theory and practice (lectures & seminar)(3) Botanical nomenclature (lectures & practicals)(4) Botanical informatics (seminar)	class/hands-on/e-learning	Marhold, Institute of Botany, Slovak Academy of Sciences; spec. Vascular plants taxonomy
Plantae: systematics	Systematics	Plant Systematics for the Kew diploma of Horticulture	e-learning/hands-on	Landrein, Kew Gardens; spec. Caprifoliaceae
Plantae: conservation, taxonomy, herbarium techniques	Herbarium Techniques, Plant Systematics, Plant Conservation, Botanic Garden Management	Herbarium Techniques CoursePlant Conservation StrategiesTropical Plant Family IdentificationSeveral postgraduate plant science courses run by universities	class/hands-on/e-learning	Paton, Royal Botanic Gardens, Kew; spec. Dicot systematics
Plantae: α -taxonomy	Tropical plant identification, herbarium techniques.	Tropical Plant family Identification course (since 2004)	class/hands-on	Utteridge, Royal Botanic Gardens, Kew; spec. Tropical plants
Higher plants: α -taxonomy, systematics	Plant systematics – molecular and morphological, nomenclature , taxonomy, classification, tropical plant identification, Myrtaceae systematics	Tropical plant identification, Myrtaceae systematics	class/hands-on/e-learning	Lucas, Royal Botanic Gardens, Kew; spec. Tropical plants
Plantae, phytogeography, diversity, systematics	Phytogeography, philosophy of science, plant systematics, vegetation ecology	Phytogeography, phytogeographical excursions, plant diversity, nature & theory.	class/hands-on/e-learning	Barfod, Univ. Aarhus, spec. Botany, higher plants
Plantae: taxonomy, systematics, biogeography	Taxonomy, Biogeography, Applied Botany	Systematic Botany, Aromatic and Medicinal Plants	class/hands-on	Kokkini, Univ Thessaloniki; spec. Plants, chemotaxonomy
Higher plants: α -taxonomy, biology, taxonomy, systematics, ecology	Taxonomy, Phylogeny, Morphology, Biogeography of Plants; Pollination and Dispersal Biology	Plant Determination courses, Biology and Ecology of Woody Plants, Reproductive Biology of Seed Plants, Taxonomy and Systematics	hands-on	Liede-Schumann, Univ Bayreuth; spec.plant systematics

Specified as discipline				
Systematics, taxonomy, Phylogeny	Taxonomy, phylogenetics, biogeography, molecular systematics, molecular evolution	Phylogenetic and Molecular Methods (M. Sc.) Phylogenetic Systematics and Alignment (Ph. D.)	class/hands-on	Petersen, NHM Denmark; spec. Botany, higher plants
Systematics, taxonomy, Phylogeny	Taxonomy, phylogenetics, biogeography, molecular systematics, molecular evolution	Phylogenetic and Molecular Methods (M. Sc.) Phylogenetic Systematics and Alignment (Ph. D.)	class/hands-on	Seberg, NHM Denmark; spec. Botany, higher plants
Systematics, α -taxonomy, phylogeny, biogeography, biodiversity	Systematics, phylogeny, biogeography, biodiversity assessments, tree of life	Biodiversity: pattern analyses; Tree of Life; Excursions to Dunes; Plant identification; seminar on Biodiversity; Tropical Flora and Vegetation	class/hands-on	Roos; Nationaal Herbarium Nederland - Leiden (training coordinator); spec. Botany
Biosystematics	Biosystematics, Methods in studying speciation	Biosystematics	class/hands-on	Kirschner, Acad. Sci (CZ); spec. agamosperous plants (+ other teaching items -Botany)
Taxonomy, Systematics, Conservation	Taxonomy, Plant Conservation	Taxonomy and biology systematic: from Linnaeus to the molecules. Introduction to the biological conservation of plants. Ph D Prog. "Biodiversity: management and conservation of species and their habitats"		Güemes, University of Valencia + Univ Alicante; spec. Botany
Herbarium management	Collection management s.l. (Herbarium collection management/The uses of herbarium in the biodiversity research/How to make an herbarium	Herbarium collections management training	class/hands-on	Stoffelen, NBGB; spec. taxonomy vascular plants
Bioinformatics	Computing methods in taxonomy (programs for identificatin, databases for taxonomy)	none	class/hands-on	Pankhurst, Royal Botanic Garden Edinburgh; spec. Botany

Palaeo & Geo				
Palaeobotany	Palaeobotany	Key Evolutionary Innovations in Palaeobotany Flora provinces through time	class/hands-on/e-learning	Van Waveren; National Museum of Natural History 'Naturalis'; spec. Palaeobotany
Palaeontology	Palaeontology, Systematic palaeontology, Palaeoecology, Palaeobiology, Oceanography	Oceanography, Palaeobiology, Palaeontology	class/hands-on	Rosso, ICRAM – Central Institute of Marine Research; spec. Bryozoa
Geology	Biosedimentology, Geobiology	None	class/hands-on/e-learning	Toscano Francesco, no contract; spec. Mollusca, Bryozoa

Research - but no teaching experience				
Entomology	Systematics Cetoniidae		class/hands-on	Dutto, Museo Civico Storia Naturale, Carmagnola; spec. Cetoniidae
Entomology	Coleoptera		class/hands-on	Bartolozzi, Natural History Museum of the Univ. of Florence; spec. Lucanidae, Brentidae
Entomology	Coleoptera, Staphylinidae, especially Xantholinini			Bordoni; C/o Museo Zoologico La Specola, Firenze
Crustacea	Taxonomy Biogeography Phylogeny of stygobitic Isopods		hands-on	Messana, Inst. for the Study of Ecosystems - CNR Firenze; spec. Isopoda
Marine	Fisheries and benthos taxonomy		class/hands-on/e-learning	Lomiri, ICRAM – Central Institute for Marine Research, “Environmental Quality Monitoring” Department I, Roma
Marine	Marine macrozoobenthos community, in particular study of Crustacea and Echinodermata Taxa		class/hands-on/e-learning	Marusso, ICRAM – Central Institute of Marine Research; spec. Crustacea, Echinodermata
Taxonomy s.l.	Evolution, Phylogeny, Molecular Systematics, Taxonomy, Faunistics, Conservation		e-learning	Garcia-Paris, Museo Nacional de Ciencias Naturales, CSIC; spec. a.o. Amphibia
Taxonomy s.l.	Evolution, Phylogeny, Molecular Systematics, Taxonomy, Faunistics, Conservation		e-learning/hands-on	Padial, Museo Nacional de Ciencias Naturales, CSIC; spec. Amphibia

Beyond Europe				
Biology	General Botany; Environmental Science; Plant Physiology; Genetics; General Biology; Marine Biology; Invertebrate Zoology; Entomology; Ecology; Human Anatomy and Physiology	New Portals to Appreciating our Global Environment (Also a co-author of the textbook)	class/hands-on/e-learning	Al-Zein, Old Dominion University Norfolk VA 23529; plant identification
Botany	Plant systematics of neotropical taxa	none	class/hands-on	Freire-Fierro, Acad. Nat.Sci., Philadelphia
Botany	Taxonomy, ethnobotany, economic botany	Gymnosperm and angiosperm taxonomy; Plant taxonomy and economic botany; plant morphogenesis; Angiosperm systematics	class/hands-on/e-learning	Lukhoba, University of Nairobi; spec. Labiatae + medicinal plants
Botany	Plant Taxonomy, General Biology	Botany 109 (Plant Taxonomy) Biology 22 (General Zoology) Biology 10 (General Biology) training on Brahms	class/hands-on/e-learning	Rubite, University of the Philippines Manila,
Marine	Zooplankton ecology, Secondary productivity, Marine biodiversity	In preparation: taxonomic training course on basic identification techniques for use in marine zooplankton of the western Indian Ocean to improve capacity of the local marine scientists	class/hands-on/e-learning	Osore, Western Indian Ocean Marine Science Association (WIOMSA), Zanzibar; spec. marine zooplankton, Copepoda
Crustacea		Workshops on copepod taxonomy	class/hands-on	Stephen, National Institute of Oceanography, Regional Centre, Kochi, Kerala, India; spec. marine copepoda.
Entomology	Insect systematics, taxonomy, biodiversity, morphology	Insect Identification, Biosystematics, Insect Morphology, Systematics of the Coleoptera	class/hands-on	Ivie, Montana State University; spec. Coleoptera
Entomology	Digital Image Processing, webdesign & databases & biodiversity informatics, insect identification & systematics	An informal 'Bug Club' for icipe students, also course in the planning of applied entomology for East Africa	e-learning	Haas, ICIPE, Nairobi, Kenya; spec. Insects
Bioinformatics - data management	Biodiversity data management	ECOMAMA Marine Data Management ODINAfrica (IOC/IODE) marine biodiversity data management	class/hands-on/e-learning	Vanden Berghe, Ocean Biogeographic Information System, Inst. of Marine and Coastal Sc., Rutgers University; data management, New Brunswick, NJ