



# **Experiences from the International University of Andalusia**

Oswaldo Trelles & Juan Falgueras  
Bioinformatics Master coordinators

how to carry out a inter-country program: logically, what  
is the curriculum, how you set it up, the challenges,  
successes etc. ([Nicky](#))



# Universidad Internacional de Andalucía (International University of Andalusia)

The UNIA is a Public University part of the Andalusian University System

It focuses on graduate studies, committed to the development of its surroundings, with a will to cooperate at international level and in solidarity terms, especially with Latin America and the Maghreb

Keywords: quality, quickness, flexibility and innovative guidance



# Target Audience

Latin America and Northern Africa

Students background:

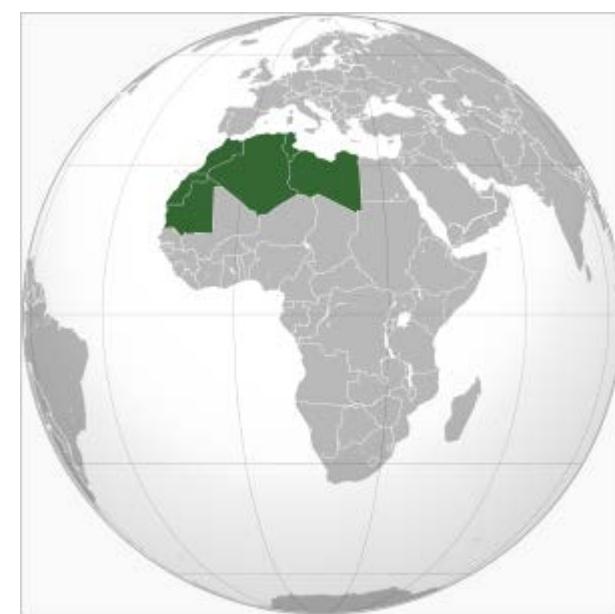
- Live sciences (biology, biochemistry, etc.)
- Computer sciences (informatics and IT)
- Recycling (or preparing) professionals for data processing

Training demand:

- Data analysis (NGS-assembly, functional annotation, gene-expression, MD... practical point of view)
- Complement local PhD programmes
- Introductory courses (Medical area)
- Advanced courses in specific technologies (HPC, cloud, MPI, ...2Colours / Affy,
- Recycling (or preparing) professionals for data processing
- Short term scientific missions (students interchanges --- strong demand)



Argentina	38,7
Bolivia	9,2
Chile	16,9
Colombia	45,6
Costa Rica	4,4
Cuba	11,3
Dominican Rep.	10,1
Ecuador	13,2
El Salvador	6,9
Guatemala	12,6
Honduras	7,2
Mexico	112,3
Nicaragua	5,5
Panama	3,2
Paraguay	6,2
Peru	27,9
Puerto Rico	3,7
Spain	44,1
Uruguay	3,5
Venezuela	26,7
over 400M	
Portugal	10,7
Brazil	198,7
over 209M	





# Other considerations

## e-Learning

- Students need a greater effort and more auto-discipline (permanent motivation)
- Facilitates the access to high-education programs to less favored regions (alternative ways to internet)
- Less diverse students inter-communication (Social networks, forums, chats, )
- Assistants or professors? More effort in the follow-up
- Different layers and backgrounds [technical or theoretical aspects; recycling (or preparing) professionals for data processing or strong basis]

Continuous follow-up

Material coherence.

New technologies, new fields, old fields

How equivalent is the academic and scientific preparation regarding traditional education

## Titles: who certifies the titles?

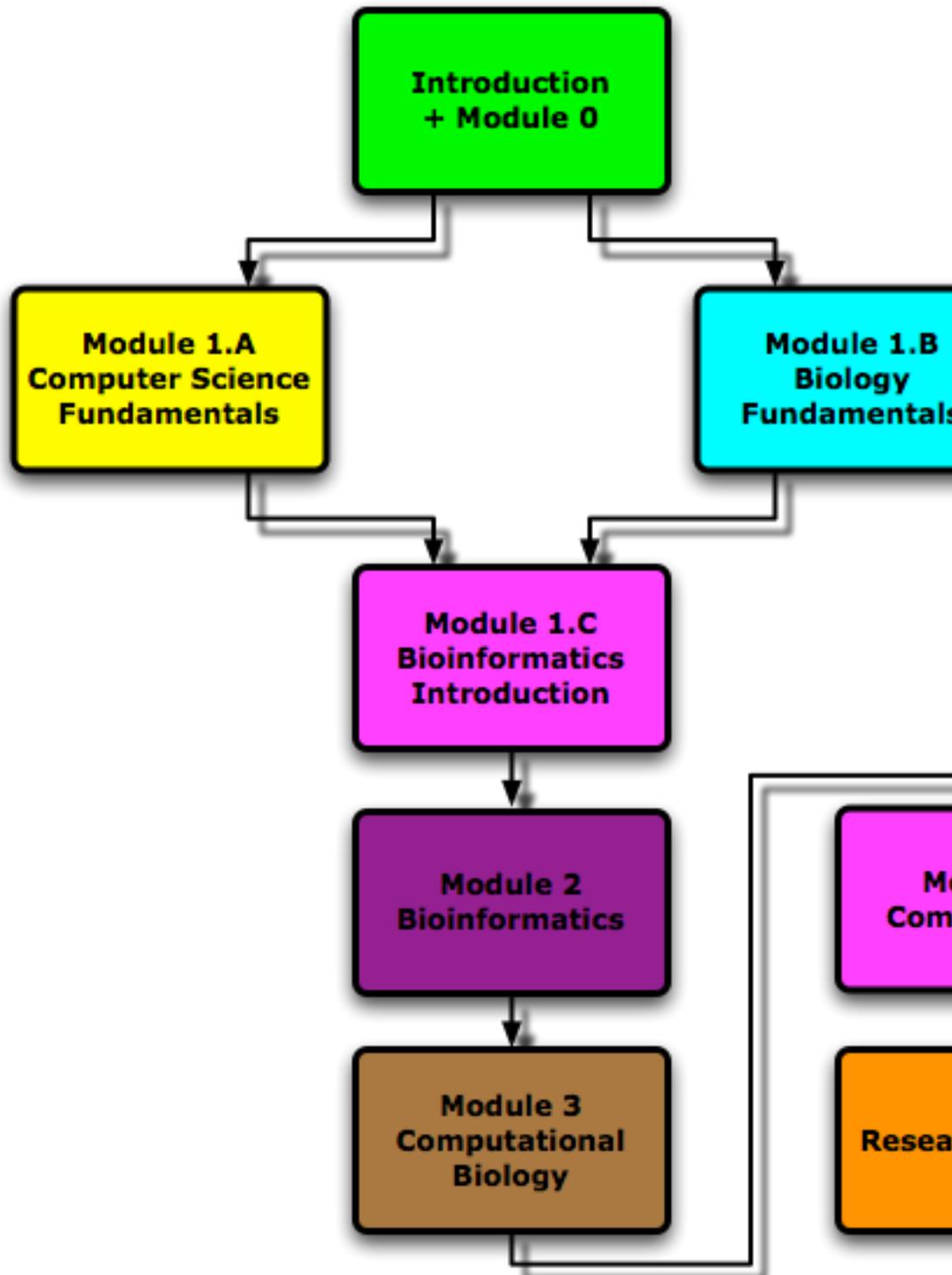
- inter-university collaborations (support from local institutions vs reimbursements and inter-institution negotiations)
- Our choice to allow accreditation for PhD studies: UNIA / Malaga
- + incorporate lectures (and material) from different (local) Universities and Institutions

## Language

- English, Portuguese, French, Spanish ?

## Technical Platform

- We used Moodle (+ system administration, etc.)
- A secretary team
- Software licenses and infrastructure (i.e. Adobe Connect licenses)



One year

...start final project

end of the year

UNIA		CRONOGRAMA MÁSTER BIOINFORMÁTICA (2010/11)			20/12/2010	
Cód	Módulos y materias			Fechas	Cr	Tutor
<b>I. MÓDULO DE INTRODUCCIÓN A LA BIOINFORMÁTICA</b>						
A0	Introducción a la bioinformática			20/12-02/01	2	OT
A0a	Motivación del curso			20/12-26/12	0	JM
A0b	Presentación, Introducción a la Bioinformática			27/12-02/01	2	OT
<b>II. MÓDULO DE FUNDAMENTOS DE INFORMÁTICA Y DE BIOLOGÍA</b>						
B1	Técnicas Informáticas			03/01-30/01	4	JF
B1a	Arquitectura de Computadores	JM:	José M. Carazo	03/01-09/01	1	AR
B1b	Sistemas Operativos	OT:	Oswaldo Trelles	10/01-16/01	1	JF
B1c	Redes de computadores	JM:	Juan Falgueras	17/01-23/01	1	AR
B1d	Bases de Datos	OT:	Juan Rodríguez	24/01-30/01	1	AR
B2	Programación para Bioinformática	JF:	Andrés Pérez	31/01-27/02	4	JF
B2a	Programación en Perl	AR:	Gonzalo Claro	31/01-20/02	3	JF
B2b	Ejercicios de bioinformática con Perl	AP:	Ana Grande	21/02-27/02	1	AR
B3	Técnicas en Biología Molecular	GC:	Toni Gabaldón	03/01-30/01	4	AG
B3a	Biología Celular	EV:	Enrique Viguera	03/01-09/01	1	AG
B3b	Bioquímica	PR:	Pilar Roca	10/01-23/01	2	AG
B3c	Biología Molecular	AM:	Antonio Muñoz	24/01-30/01	1	AG
B4	Técnicas en Genética			31/01-27/02	4	EV
B4a	Introducción a la Genética			31/01-13/02	2	EV
B4b	Sistemática y Evolución (Catalogación de organismos)			14/02-27/02	2	EV
B5	Común: Servidores Web en Bioinformática			28/02-03/04	5	AP
B5a	Laboratorio Experimental Virtual			28/02-06/03	1	AP
B5b	Servidores de datos + Perl II			07/03-03/04	4	AP

Elección Trabajo Fin de Máster

### III. MÓDULO DE BIOINFORMÁTICA CLÁSICA

C1	Bioinformática clásica I: Secuenciación y bases de datos	04/04-27/04	4	AM
C1a	Bases de datos moleculares	04/04-13/04	2	
C1b	Laboratorio de bases de datos moleculares	14/04-20/04	1	AM
C1c	Ánálisis de variación poblacional (SNPs)	21/04-27/04	1	
C2	Bioinformática clásica II: Análisis de secuencias y filogenia	28/04-29/05	6	TG
C2a	Identificación y modelado de genes, Análisis y comparación de genomas	28/04-08/05	2	
C2b	Comparación de secuencias	09/05-18/05	2	TG
C2c	Alineamiento Múltiple y análisis de proteínas. Filogenia molecular	19/05-29/05	2	
C3	Bioinformática clásica III: estructural y transcriptómica	30/05-26/06	5	GC
C3a	Estructura de Proteínas.	30/05-08/06	2	
C3b	Expresión de Genes	09/06-19/06	2	GC
C3c	Proteómica	20/06-26/06	1	
C4	Biología computacional	27/06-24/07	4	OT
C4a	Bioinformática en la Web	27/06-03/07	1	AP
C4b	Minería de datos moleculares	04/07-17/07	2	
C4c	Integración de bases de datos y servicios	18/07-24/07	1	OT

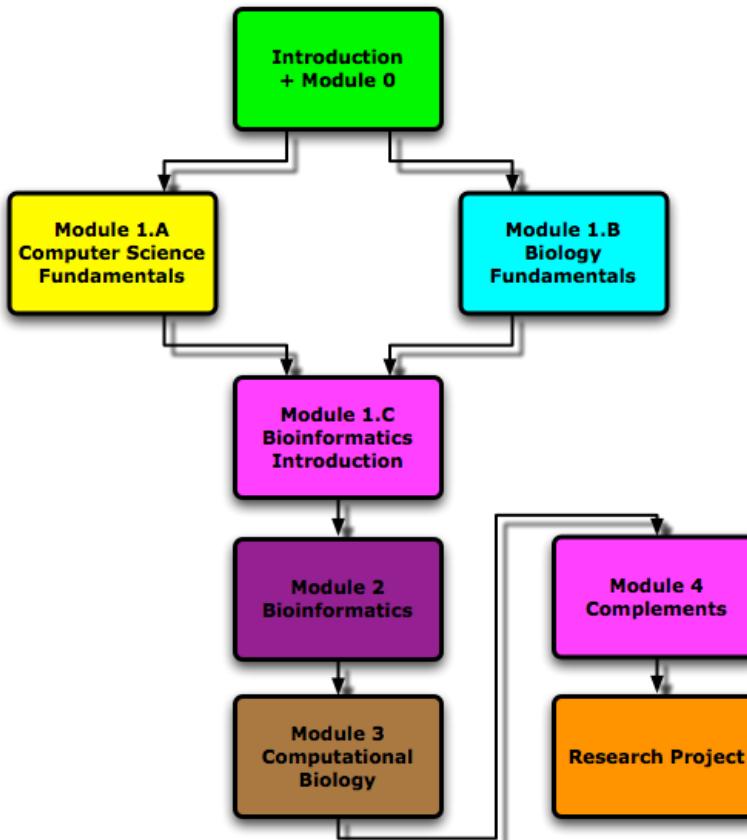
### IV. MÓDULO DE COMPLEMENTOS DE BIOINFORMÁTICA

D1	Complementos de bioinformática	27/06-24/07	4	EV
D1a	Fundamentos de Biotecnología	27/06-10/07	2	EV
D1b	Estadística bioinformática	11/07-24/07	2	PR

TRABAJO FIN DE MÁSTER

14

60



# Summing up



# e-learning comments

## Advantages

- e-learning brings the possibility of researching to many people that may had no other possibility
- e-learning is self-paced and gives students a chance to speed up or slow down as necessary
- Skip over material you already know and focus on topics you'd like to learn
- Make collaboration among students much easier

## Disadvantages

- Higher dependence on the quality of the materials
- Students must have adequate computer skills and have a higher motivation for active and continuous participation
- Hands-on or lab work is difficult to simulate
- Difficult final student evaluation

## Solutions

- Quality of the materials: Resort to every possible tool and external reference
- Students skills: Use a central and easy of use platform. Participation: Create every possible way of active communication among them and between you and them
- Lab tasks: try to use web apps (not installs) and active and analytic observation of other's work
- Final evaluation: use Video conferencing



# Master in bioinformatics

- Identify the target audience needs and prepare a coherent plan to solve them
- Formal definition of collaborations and administrative procedures
- Define the technical platform for material delivering and communications (all type)
- Permanent monitoring, control and reaction!
- Permanent follow-up of students