



Università di Modena e Reggio Emilia

School of Graduate Studies

*Multiscale Modelling,
Computational Simulations and Characterization
in Material and Life Sciences*

COMPILE AND RETURN :

Student:	Maria Federico
Address:	<i>Dept. Information Engineering</i> University of Modena and Reggio Emilia Via Vignolese 905 - 41100 Modena (Italy)
Tutors:	Dr Manuela Montangero (Univ. of Modena and Reggio Emilia) Dr Nadia Pisanti (Univ. of Pisa)

typology: 1 year					Credits (final assigned by the Faculty)	
BASIC TRAINING						
	Course Title, level (CDL or CDLM)	Period	Exam if any	hours		
<p><u>COURSES from UNIMORE or other Italian Universities</u> (Title, CDL (basic level)/CDLM (second level), period, n. of hours. If the examination has also been attended report the score obtained)</p> <p>[Credits : <20hrs: 3= attending 6= with examination; 20-40hrs: 5= attending 8= with score; >40 hrs: 7= attending 10= with score]</p>	Informatica chimica, CDL Chimica	March- June 2008	Approved	32		
	Progettazione di proteine, CDLM Biotecnologie Mediche	Apr-June 2008	Approved	32		
<p><u>COURSES from foreign Universities</u> (Title, Kind of Courses, University, Country, period, n. of hours. If the examination has also been attended report the score obtained)</p> <p>[Credits : <20 hours: 3= attending 6= with score; 20-40 hours: 5= attending 8= with score; >40 hours: 7= attending 10= with score]</p>						

TRAINING TO RESEARCH				
	Course Title, level (CDL or CDLM)	Period	Exam if any	hours
<p><u>COURSES from M2SCS</u> (Course, Module Title, period, hours. If the examination has also been attended write Approved)</p> <p>[Credits : 3hours = 1 credit]</p>	Course 4 Module 3: Structural properties	Mar 2008		6
	Course 2 Module 1: Introduction to data analysis	Apr 2008	Approved	6
	Course 2 Module 4: Nature inspired methods in Data analysis: Genetic algorithms and Neural Networks	Apr 2008		6
	Course 2 Module 5: Bayesian Methods	Apr 2008		6
	Course 4 Module 2: Experimental methods for the determination of the three-dimensional structure of biological macromolecules	Apr 2008	Approved	6
	Course 3 Module 5: Computational neuroscience	May 2008		6
	Course 1 Module 1: Machine Learning: methods and applications	Oct 2008		9
	Course 1 Module 3: Algorithms for Sequence Alignment and Protein Comparison	Oct 2008	Approved	6
	Course 1 Module 4: Biological Sequence Databases and Fast Access algorithms	Oct 2008	Approved	9
	Course 5 Module 2: Homology Modelling of protein structure	Oct 2008	Approved	6
	Course 3 Module 2: Computer Simulations as numerical experiments	Oct 2008		6
	Course 3 Module 3: Computational simulations: from quantum- to meso-scale	Oct 2008		6
	Course 5 Module 3: Computational simulations of inorganic surface/biomolecule	Nov 2008		6

	English Course	Oct 2008		20	
<p><u>COURSES from other Universities' Doctoral Schools</u> (Title, University, period, hours. If the examination has also been attended report the score obtained and/or Approved)</p> <p>[Credits : <20 hours: 3= attending 7= with score; 20-40 hours: 5= attending 8= with score; >40 hours: 7= attending 10= with score]</p>					

Advanced TRAINING TO RESEARCH

	Title, speaker	Location	Period	hours	
<p><u>SEMINARS</u> (Title, Speaker, Affiliation, Location, Date, hours)</p> <p>[Credits : 0.5 (max 4 per year)]</p>	Basic principles of Monte Carlo Method, Prof. Carlo Jacoboni, Dept Physics University of Modena and Reggio Emilia	M2CSC	May 22 2008	2	
	Bioinformatica: la matematica incontra le scienze della vita, Prof. Silvio Bicciato, Faculty of Biosciences and Biotechnologies, University of Modena and Reggio Emilia,	Accademia Nazionale di Scienze Lettere e Arti di Modena	May 21 2008	2	
	Systems Biology: uno sguardo d'insieme sulle definizioni e sugli approcci, Dr Daniele Dell'Orco, Department of Chemistry and Dulbecco Telethon Institute University of Modena and Reggio Emilia	Aula H Centro Didattico via Tito Speri	May 23 2008	3	
<p><u>WORKSHOP (1-2 days)</u> (Title, Organization, location, date and n. of hours)</p> <p>[Credits: 2-3 ; (min 3 – max 9 x year)]</p>	Workshop in “New Trends in Drug Discovery”, Università degli Studi di Parma Dipartimento Farmaceutico	Centro Congressi S. Elisabetta Parma	Feb 29 2008	5	
<p><u>SCHOOL, etc. (>= 3 days)</u> (Title, Organization, Location, date and hours)</p>	School on Randomized Algorithms, Centro di Ricerca Matematica Ennio De Giorgi	Collegio Puteano Scuola Normale Superiore Pisa	Feb 4-8 2008	20	

[Credits: 3-5 ; (max 10 x year)]	International Summer School on Bioinformatics and Computational Biology on “Biological Networks: Evolution, Interaction and Computation”, Dipartimento di Matematica ed Informatica Università degli Studi di Catania, Lipari (ME)	Dipartimento di Matematica ed Informatica Università degli Studi di Catania, Lipari (ME)	June 14-21 2008	18 + final exam (A)	
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	Project Title, Institution	Location	Period	
<p><u>PERIOD ABROAD (>= 1 month)</u> (University/Research Centre, location, period, title of Research Project)</p> <p>[Credits: 2 per month, max 24]</p>				
<p><u>STAGE (>= 1 month)</u> (Company/Research Centre, location, subject, duration)</p> <p>[Credits: 2 per month, max 24]</p>				
<p><u>National and International CONGRESS and CONFERENCES – Attending only (NB if the student presented a poster or an oral communication the CFU are attributed only in the next items) (Attending only, Title, location, dates)</u></p> <p>[Credits: 4; (max 8 x year)]</p>				
<p><u>POSTER COMMUNICATIONS to National and International CONGRESS and CONFERENCES –</u> (Title of contribution, authors, underline the presenting author, title of Congress, location, dates)</p> <p>[Credits: 3-5]</p>				
<p><u>ORAL COMMUNICATIONS to National and International CONGRESS and CONFERENCES –</u> (Title of contribution, authors, underline the presenting author, title of Congress, location, dates)</p> <p>[Credits: 5 - 8]</p>	<p><i>Suffix Tree Characterization of Maximal Motifs in Biological Sequences.</i></p> <p>M. Federico, N. Pisanti. Workshop on Algorithms in Molecular Biology (ALBIO'08), Wien, Austria</p>		<p>July 7-9 2008</p>	
<p><u>PUBLICATIONS ON BOOK PROCEEDING (> 1 page)</u> (Authors, title of paper, Proceeding, year, Vol., pages and editor, ISBN)</p> <p>[Credits: 5 - 8]</p>	<p>M. Federico, N. Pisanti, <i>Suffix Tree Characterization of Maximal Motifs in Biological Sequences</i>, "Proceedings of Bioinformatics Research and Development (BIRD)", 2008, Springer Communications in Computer and Information Science 13, pages 456--465, Ed. by M. Elloumi, J. Kung, M. Linial, R. F. Murphy, K. Schneider, C. Toma, ISBN: 3-540-70598-8</p>			

<p><u>PUBLICATIONS ON JOURNALS AND BOOKS</u> (Authors, title of paper, Title of Journal, year, Vol., pages, ISSN or ISBN, Imp Fact) [Credits: 12 = International; 5= National]</p>		
<p><u>PATENTS</u> [Credits: Attributed case by case]</p>	5 man months PRIN 2006: Problemi inversi in medicina e astronomia	
THESIS		
<p><u>Research Activity</u> (Title of Annual Report) [Credits: 10 (1year), 20 (2 year), 30 (3 year)]</p>	Sequence-based Prediction of Protein-Protein Interaction Sites Extraction of Structured Motifs from DNA sequences	
OTHERS		
<p><u>Activities thought to be useful for the evaluation</u> [Credits: Attributed case by case]</p>		

typology: 2 year					Credits (final assigned by the Faculty)
BASIC TRAINING					
	Course Title, level (CDL or CDLM)	Period	Exam if any	hours	
<p><i><u>COURSES from UNIMORE or other Italian Universities</u></i> (Title, CDL (basic level)/CDLM (second level), period, n. of hours. If the examination has also been attended report the score obtained)</p> <p>[Credits : <20hrs: 3= attending 6= with examination; 20-40hrs: 5= attending 8= with score; >40 hrs: 7= attending 10= with score]</p>	Biologia e Genetica generale, CdLM Medicina e Chirurgia	March-May 2009		32	
<p><i><u>COURSES from foreign Universities</u></i> (Title, Kind of Courses, University, Country, period, n. of hours. If the examination has also been attended report the score obtained)</p> <p>[Credits : <20 hours: 3= attending 6= with score; 20-40 hours: 5= attending 8= with score; >40 hours: 7= attending 10= with score]</p>					

TRAINING TO RESEARCH					
	Course Title, level (CDL or CDLM)	Period	Exam if any	hours	
<p><u>COURSES from M2SCS</u> (Course, Module Title, period, hours. If the examination has also been attended write Approved)</p> <p>[Credits : 3hours = 1 credit]</p>	Course 3 Module 1:Bioinformatics and Chemoinformatics	June 2009		6	
<p><u>COURSES from other Universtyies' Doctoral Schools</u> (Title, University, period, hours. If the examination has also been attended report the score obtained and/or Approved)</p> <p>[Credits : <20 hours: 3= attending 7= with score; 20-40 hours: 5= attending 8= with score; >40 hours: 7= attending 10= with score]</p>	Algoritmi evolutivi ed euristiche di ottimizzazione: teoria e applicazioni, University of Modena and Reggio Emilia (<i>International Doctorate School in Information and Communication Technologies</i>)	June 4, 5, 22, 2009		16	
	Biological sequence analysis, University of Pisa (<i>Doctorate School in Computer Science</i>)	Sept 28 - Oct7, 2009		22	

Advanced TRAINING TO RESEARCH

	Title, speaker	Location	Period	hours	
<p><u>SEMINARS</u> (Title, Speaker, Affiliation, Location, Date, hours)</p> <p>[Credits : 0.5 (max 4 per year)]</p>					
<p><u>WORKSHOP (1 - 2 days)</u> (Title, Organization, location, date and n. of hours)</p> <p>[Credits: 2-3 ; (min 3 – max 9 x year)]</p>					
<p><u>SCHOOL, etc. (>= 3 days)</u> (Title, Organization, Location, date and hours)</p> <p>[Credits: 3-5 ; (max 10 x year)]</p>					

	Project Title, Institution	Location	Period	
<p><u>PERIOD ABROAD (>= 1 month)</u> (University/Research Centre, location, period, title of Research Project)</p> <p>[Credits: 2 per month, max 24]</p>	<p><i>“Finding long multiple repeats in biological sequences using filtering techniques”</i>, INRIA Rhône-Alpes and Laboratoire de Biométrie et Biologie Évolutive</p>	<p>Université Claude Bernard – Lyon 1, Lyon (Villeurbanne)</p>	<p>August 1 2009 – December 31 2010</p>	
<p><u>STAGE (>= 1 month)</u> (Company/Research Centre, location, subject, duration)</p> <p>[Credits: 2 per month, max 24]</p>				
<p><u>National and International CONGRESS and CONFERENCES – Attending only (NB if the student presented a poster or an oral communication the CFU are attributed only in the next items) (Attending only, Title, location, dates)</u></p> <p>[Credits: 4; (max 8 x year)]</p>				
<p><u>POSTER COMMUNICATIONS to National and International CONGRESS and CONFERENCES –</u> (Title of contribution, authors, underline the presenting author, title of Congress, location, dates)</p> <p>[Credits: 3-5]</p>				
<p><u>ORAL COMMUNICATIONS to National and International CONGRESS and CONFERENCES –</u> (Title of contribution, authors, underline the presenting author, title of Congress, location, dates)</p> <p>[Credits: 5 - 8]</p>	<p><i>An Efficient Algorithm for Planted Structured Motif Extraction.</i></p> <p><u>M. Federico</u>, P. Valente, M. Leoncini, M. Montangelo, R. Cavicchioli. Workshop on Breaking Frontiers of Computational Biology (COMPBIO'09), Ischia (Italy)</p> <p><i>Suffix Tree Characterization of Maximal Motifs in Biological Sequences.</i></p> <p><u>M. Federico</u>, N. Pisanti. FIRB'09 Annual Project Meeting for Pattern Discovery in Discrete Structures with Applications to Bioinformatics, University of Palermo Department of Mathematics and Applications (Italy)</p>		<p>May 18-20, 2009</p> <p>Feb 23-24, 2009</p>	

<p><u>PUBLICATIONS ON BOOK PROCEEDING (> 1 page)</u> (Authors, title of paper, Proceeding, year, Vol., pages and editor, ISBN)</p> <p>[Credits: 5 - 8]</p>	<p>M. Federico, P. Valente, M. Leoncini, M. Montangero, R. Cavicchioli. <i>An Efficient Algorithm for Planted Structured Motif Extraction</i>. In Proceedings of ACM International Conference on Computing Frontiers, 2009, pages 1-6, ISBN:978-1-60558-556-7</p>		
<p><u>PUBLICATIONS ON JOURNALS AND BOOKS</u> (Authors, title of paper, Title of Journal, year, Vol., pages, ISSN or ISBN, Imp Fact)</p> <p>[Credits: 12 = International; 5= National]</p>	<p>M. Federico, N. Pisanti. <i>Suffix Tree Characterization of Maximal Motifs in Biological Sequences</i>, Theoretical Computer Science, 2009, vol 410 issue 43, pages 4391-4401, ISSN:0304-3975, impact factor: 0.806</p>		
<p><u>PATENTS</u></p> <p>[Credits: Attributed case by case]</p>			
<p>THESIS</p>			
<p><u>Research Activity</u> (Title of Annual Report)</p> <p>[Credits: 10 (1year), 20 (2 year), 30 (3 year)]</p>	<p>Discovery of repeated patterns in biological sequences</p> <p>Sequence-based Prediction of Protein-Protein Interaction Sites</p>		
<p>OTHERS</p>			
<p><u>Activities thought to be useful for the evaluation</u></p> <p>[Credits: Attributed case by case]</p>	<p>Teaching assistant for the Course of <i>Algoritmi e Strutture Dati 2008-2009</i> (Prof. Mauro Leoncini), CDL Informatica University of Modena and Reggio Emilia, 30 hrs</p>		

typology: 3 year					Credits (final assigned by the Faculty)
BASIC TRAINING					
	Course Title, level (CDL or CDLM)	Period	Exam if any	hours	
<p><u>COURSES from UNIMORE or other Italian Universities</u> (Title, CDL (basic level)/CDLM (second level), period, n. of hours. If the examination has also been attended report the score obtained)</p> <p>[Credits : <20hrs: 3= attending 6= with examination; 20-40hrs: 5= attending 8= with score; >40 hrs: 7= attending 10= with score]</p>					
<p><u>COURSES from foreign Universities</u> (Title, Kind of Courses, University, Country, period, n. of hours. If the examination has also been attended report the score obtained)</p> <p>[Credits : <20 hours: 3= attending 6= with score; 20-40 hours: 5= attending 8= with score; >40 hours: 7= attending 10= with score]</p>					

TRAINING TO RESEARCH				
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<p><u>COURSES from M2SCS</u> (Course, Module Title, period, hours. If the examination has also been attended write Approved)</p> <p>[Credits : 3hours = 1 credit]</p>				
<p><u>COURSES from other Universtyies' Doctoral Schools</u> (Title, University, period, hours. If the examination has also been attended report the score obtained and/or Approved)</p> <p>[Credits : <20 hours: 3= attending 7= with score; 20-40 hours: 5= attending 8= with score; >40 hours: 7= attending 10= with score]</p>				

Advanced TRAINING TO RESEARCH

	Title, speaker	Location	Period	hours	
<p><u>SEMINARS</u> (Title, Speaker, Affiliation, Location, Date, hours) [Credits : 0.5 (max 4 per year)]</p>					
<p><u>WORKSHOP (1 - 2 days)</u> (Title, Organization, location, date and n. of hours) [Credits: 2-3 ; (min 3 – max 9 x year)]</p>					
<p><u>SCHOOL, etc. (>= 3 days)</u> (Title, Organization, Location, date and hours) [Credits: 3-5 ; (max 10 x year)]</p>					

	Project Title, Institution	Location	Period	
<p><u>PERIOD ABROAD (>= 1 month)</u> (University/Research Centre, location, period, title of Research Project)</p> <p>[Credits: 2 per month, max 24]</p>	<p>“Finding long multiple repeats in biological sequences using filtering techniques”, INRIA Rhône-Alpes and Laboratoire de Biométrie et Biologie Évolutive</p>	<p>Université Claude Bernard – Lyon 1, Lyon (Villeurbanne)</p>	<p>January 1 2010 – April 30 2010</p>	
<p><u>STAGE (>= 1 month)</u> (Company/Research Centre, location, subject, duration)</p> <p>[Credits: 2 per month, max 24]</p>				
<p><u>National and International CONGRESS and CONFERENCES – Attending only (NB if the student presented a poster or an oral communication the CFU are attributed only in the next items) (Attending only, Title, location, dates)</u></p> <p>[Credits: 4; (max 8 x year)]</p>				
<p><u>POSTER COMMUNICATIONS to National and International CONGRESS and CONFERENCES –</u> (Title of contribution, authors, underline the presenting author, title of Congress, location, dates)</p> <p>[Credits: 3-5]</p>				
<p><u>ORAL COMMUNICATIONS to National and International CONGRESS and CONFERENCES –</u> (Title of contribution, authors, underline the presenting author, title of Congress, location, dates)</p> <p>[Credits: 5 - 8]</p>	<p><i>An optimized filter for finding multiple repeats in DNA sequences.</i></p> <p><u>M. Federico</u>, P. Peterlongo, N. Pisanti. 8th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2010), Hammamet (Tunisia).</p>		<p>May 16-19 2010</p>	
<p><u>PUBLICATIONS ON BOOK PROCEEDING (> 1 page)</u> (Authors, title of paper, Proceeding, year, Vol., pages and editor, ISBN)</p> <p>[Credits: 5 - 8]</p>	<p>M. Federico, P. Peterlongo, N. Pisanti. “An optimized filter for finding multiple repeats in DNA sequences”, <i>Proceedings of the 8th ACS/IEEE International Conference on Computer Systems and Applications</i> (AICCSA 2010), 2010, pages 1-8. ISBN: 978-1-4244-7715-9</p>			

<p><u>PUBLICATIONS ON JOURNALS AND BOOKS</u> (Authors, title of paper, Title of Journal, year, Vol., pages, ISSN or ISBN, Imp Fact)</p> <p>[Credits: 12 = International; 5= National]</p>		
<p><u>PATENTS</u></p> <p>[Credits: Attributed case by case]</p>		
<p>THESIS</p>		
<p><u>Research Activity</u> (Title of Annual Report)</p> <p>[Credits: 10 (1year), 20 (2 year), 30 (3 year)]</p>	<p>Discovery of motifs and long multiple repeats in biological sequences</p>	
<p>OTHERS</p>		
<p><u>Activities thought to be useful for the evaluation</u></p> <p>[Credits: Attributed case by case]</p>	<p>Publications in preparation:</p> <ul style="list-style-type: none"> • M. Federico, P. Valente, M. Montangero, M. Leoncini. “Comparison of exact approaches for the extraction of structured motifs in biological sequences”. To be submitted to international journal. • M. Federico, P. Peterlongo, N. Pisanti, M.-F. Sagot. “Efficient exhaustive discovery of long multiple repeats in biological sequences”. To be submitted to international journal. • L. Palmieri, M. Federico, M. Leoncini, M. Montangero, P. Valente. “Prediction of Solvent Accessibility from protein sequence using homology search and look-up tables”. To be submitted to international journal • M. Federico, N. Pisanti. “Separating real motifs with Hamming distance from artifacts based on motif conservation”. To be submitted to international conference. <p>Member of IPC for International Conference on Information Technology in Bio- and Medical Informatics (ITBAM'10) in conjunction with the 21st DEXA – DEXA'10, August 30 - September 3, 2010, Bilbao (Spain).</p>	

