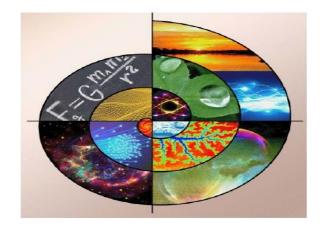


## UNIVERSITY OF THE AEGEAN SCHOOL OF HUMANITIES DEPARTMENT OF PRE-SCHOOL EDUCATION SCIENCES AND EDUCATIONAL DESIGN

## POSTGRADUATE STUDIES PROGRAMME

**TECHNOLOGIES IN EDUCATION: INTERDISCIPLINARY APPROACH** 



## **STUDY GUIDE**

ACADEMIC YEAR 2014-2015 Rhodes

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#### Welcome to the Postgraduate Study Programme

In between the intellect and the experience the meanings, the memories, our reflections and our expressions are formed. In between communication and planning, we comprehend the phenomena and we invent actions and constructions.

The evolving natural language is enriched with formal languages, the scientific concepts are intertwined into theories, the theories generate new concepts and describe models, the models approach the phenomena, plan constructions, organize situations.

The way we perceive reality forms our intelligence, mentally organizes relationships, actions and the evolution of human civilization.

Evolution combines adaptation with by creation and engineering.

In the 19th century, Auguste Compte in *Cours de Philosophie Positive* ranked Sciences (and the phenomena they investigate), starting from the most abstract, general, simple and distant from humans to the most specific, close and in direct relationship with humans: Mathematics, Astronomy, Physics, Chemistry, Biology and finally Sociology (including psychology).

In the 20th century, Jean Piaget in *Genetic Epistemology* connected the ends of the hierarchy thus transforming it to a cycle and he proposed a structural approach to knowledge and learning. Psychology is inherent in mathematics as much as mathematics is inherent in mathematics. There is a relationship between the particular knowledge learned and the learning subject.

Scientific knowledge varies in line with the variation of the relationship between the learning subject and the respective scientific corpus. In this evolving relationship field the interdisciplinary approaches to the learning and teaching science are built.

The international society of knowledge prioritizes scientific literacy for all, without any exclusions. International surveys and organizations attempt to reverse the massive educational failure in Mathematics and the Sciences and to increase the functional integration of ICT in education.

The Didactics of Mathematics and Science in interaction with ICT and the modern virtual environment, build a new image of science, enriched by their epistemology and by the learning and the teaching processes. Thus, they epistemologically found the modern educational planning.

I welcome you to this educational and technological adventure through the approaches of our Postgraduate Study Programme. You'll need intense study, qualitative cooperation, bold exchanges of views, of innovative proposals. I wish you all a creative and enjoyable academic experience!

Rhodes, February 2015 Professor Fragiskos Kalavasis Director of P.S.P



#### **UNIVERSITY OF THE AEGEAN**

The University of the Aegean was founded in 1984 by Presidential Decree 83/1984. It is a dynamically developing educational institution, which in 30 years of operation managed to be one of the largest universities in the country with five schools, 17 departments, 30 postgraduate programs and strong international research and action and participation. The academic activities implemented in six islands of the Aegean: Lesvos, Chios, Samos, Rhodes, Syros and Lemnos.

The ambition of the university community is to establish the group of islands in the Archipelago as a center of excellence in science and education in accordance with the historical heritage of the area and scope of aligning an Interuniversity and interdisciplinary cooperation network for research and knowledge

#### **SCHOOL OF HUMANITIES**



The School of Humanities is based in Rhodes, includes three undergraduate department: "Department of Primary Education", "Department of Pre-school Education Sciences and Educational Design", "Department of Mediterranean Studies". The School includes 10 Postgraduate Studies Programme. All three departments of the School elaborates Doctoral Dissertations.

## The School of Humanities, University of the Aegean in Rhodes distinction:

- On the importance it attaches to the Interdisciplinary and Technological documentation of Teaching and Research.
- To focus on development theories of individual and collective organizations. Languages, Mediterranean cultures and international relations.
- For the fact that it has created the most comprehensive Studies Education system in our country.

#### THE DEPARTMENT OF PRE-SCHOOL EDUCATION SCIENCES AND EDUCATIONAL DESIGN

Combines studies with participation in international scientific research and development expertise to graduates and graduates preschool teachers, the Master / graduates and PhD of the Department have advanced training in educational planning in modern fields of knowledge and new forms of education. The interdisciplinary and technological approach of department of pre-school education sciences and educational design extends in cognitive areas, educational material and administration.

## ADMINISTRATION AND MANAGEMENT

The Administration of the University is managed by the **Senate**, and the **Rector** and recently by the **Rector's Council.** 

President of the Council of the University of the Aegean is the Emeriti Professor of the National and Kapodistrian University of Athens, Stavros Thomadakis

The Rectorate for the academic year 2014-2015 are:

Rector:	Professor Stefanos Gritzalis
	e-mail: <u>rector@aegean.gr</u>
Vice Rector	Research and Development
	Professor Amalia Polydoropoulou
	e-mail: <u>vice-rector-rdfi@aegean.gr</u>
Vice Rector	Academic Affairs and Quality Assurance
	Associate Professor Alexandra Bounia
	e-mail: <u>vice-rector-aaqa@aegean.gr</u>
Vice Rector	International Polations, Student Affairs and Alumni
vice needor	International Relations, Student Affairs and Alumni
	Associate Professor Spyros Syropoulos
	e-mail: vice-rector-irsaa@aegean.gr

Dean of the School of Humanities of Rhodes is Professor Kosntantinos Vratsalis

**Chairman** of the department of pre-school education sciences and educational design is Professor Xrisi Vitsilaki.

## P. S. P."DIDACTICS OF MATHEMATICS, SCIENCE AND INFORMATION AND COMMUNICATION TECHNOLOGIES IN EDUCATION: INTERDISCIPLINARY APPROACH "

The department of pre-school education sciences and educational design, University of the Aegean, organizes and runs the academic year 2014-2015, Postgraduate Studies Programme (*P*.S.P) entitled "**Didactics of Mathematics, Science and Information and Communication Technologies in Education: Interdisciplinary Approach**", which offers **Master Degree (M.Sc.)** (FEK 1137, 05.05.2014) The purpose of Postgraduate Studies Programme is the production and dissemination of knowledge in the field of didactics of science (mathematics, natural sciences and informatics and communications) and technologies of information and communication in Education under the Education Engineering through the viewing Interdisciplinary approaches.

### ADMINISTRATION OF POSTGRADUATE STUDY PROGRAMME

According to Article 2 of Law. 3685/2008, the bodies responsible for the operation of the Postgraduate Study Program (PSP) at the Department are:

(a) **The General Assembly of Special Composition (G.A.S.C)**, composed of the Chairman of the Department, the faculty members of the Department and two (2) representatives of Graduate Students.

(b) **The Steering Committee (S.C.)**, according to the first /18.09.2014 decision of the extraordinary G.A.S.C. of the Department consists of:

#### **Regular Members**

Professor, Fragiskos Kalavasis Professor, Xrisi Vitsilaki Professor, Anastasios Kontakos Professor, Soultana Kafousi Assistant Professor, George Fesakis

#### Substitute Members

Professor, John Hadzigeorgiou Associate Professor, Potitsa Xanthakou Assistant Professor, John Papadatos Assistant Professor, Panagiotis Stamatis Assistant Professor, Basilis Papavasileiou

(c) **The Selection Committee and Evaluation** of graduate students defined by the Special General Assembly Configurations of the Department.

#### Director and Scientific Director of the Postgraduate Study Program:

Professor Fragiskos Kalavassis

## SECRETARIAT, ORGANIZATION AND TECHNOLOGICAL SUPPORT.

Mairi	Head of Department of Preschool Education Sciences and Educational Design
Konsantinou	Secretary
	Contact: Dimokratias 1 Ave, "Building 7 <sup>ng</sup> Martiou", Rhodes P.C. 85100, *Tel
	2241099110
	e-mail: konstadinou@rhodes.aegean.gr
Sevasti	Secretary P.S.P. «Didactics of Mathematics, Science and Information and
Efstathiou	Communication Technologies in Education: Interdisciplinary Approach»
	Contact: Rhodes-Kalithea Av. Post Code 85100, Rhodes, *Tel: 2241099192
	e-mail: <b>rhodes pms dt@aegean.gr</b>
Xrisanthi	Administration Support P.S.P. «Didactics of Mathematics, Science and
Kariki	Information and Communication Technologies in Education: Interdisciplinary
	Approach»
	<b>Contact:</b> Rhodes-Kalithea Av. Post Code 85100, Rhodes,*Tel: 2241099421
	Fax:2241099420
	e-mail: <u>ckariki@rhodes.aegean.gr</u>
Natasa	Organizational Support and Pedagogical Documentation
Kamenidou	Contact: Dimokratias 1 Ave, "Building 7 <sup>ng</sup> Martiou", Rhodes P.C. 85100, *Tel:
Special Technical	2241099183
Laboratory	e-mail: <u>Kamenidou@aegean.gr</u>
Personnel,	
University	
Of the Aegean	
Dimitris	Technological Support P.S.P. «Didactics of Mathematics, Science and
Markouzis	Information and Communication Technologies in Education: Interdisciplinary
	Approach».
	e-mail: markouzis@aegean.gr

# THE WEBSITE OF THE POSTGRADUATE STUDY PROGRAMME ON THE INTERNET

The Postgraduate Study Programme (P.S.P.) «Didactics of Mathematics, Science and Information and Communication Technologies in Education: Interdisciplinary Approach» has its own website on the Internet at : http://www.pse.aegean.gr/dithenet/



#### Welcome to the website of the PSP

DIDACTICS OF MATHEMATICS, SCIENCE AND INFORMATION AND COMMUNICATION TECHNOLOGIES IN EDUCATION: INTERDISCIPLINARY APPROACH

P.S.P. « Didactics of Mathematics, Science and ICT in Education: Interdisciplinary Approach »

#### AIM OF THE POSTGRADUTE STUDY PROGRAMME

The aim of P.S.P. is education and training qualified scientists capable of contributing to the didactics Statements design for teaching Science in Interdisciplinary approach, making use of Information Technologies and Communication and appropriate educational material of any kind, and the design of educational programmes, environments and applications Technologies of Information and Communication adaptable to all levels of education (preschool, primary, secondary, tertiary) and in all forms of education describable conditions (formal, informal, open, lifelong) to the establishment of multidisciplinary scientific knowledge.

Graduates of this M.Sc. have complete and modern pedagogical and technological training to employed professional in the field of Education on actions relating to teaching and social diffusion of scientific knowledge and ICT, and in Mathematics and Science and ICT interdisciplinary approach and assessment programmes.

Holders of M.Sc. can operate effectively in innovative programmes coordinators positions and development or research project Science education, directors of training programs, management development curricula and educational software, educational material designer for Mathematics and Science, coordinators of scientific activities for school-family-community connection, adult education and special classes in mathematics, science and ICT.

### **REGULATION OF STUDY – PROGRAMME STUCTURE STUDIES**

The total credits (ECTS) required for the acquisition of Master Degree amounted to 75 and the P.S.P. is characterized intensive. Specifically required:

Regular attendance and successful examination in eight (8) compulsory courses conducted during two (2) semesters and

The development and successful examination thesis completed by the end of the study period.

Code	Courses	Ects	Loads of work
Х1	A Semester Title: Didactics of Mathematics and Science: An interdisciplinary approach Instructors: Fragiskos Kalavasis George Kritikos Andreas Moutsios-Rentzos Guest seminars: Anastasios Kiprianidis	7,5	225
X2	Title : Modern Theories for Learning and Organization of Educational Structures Instructors : Anastasios Kodakos Stamatis Panagiotis Guest seminars: Professor Michael Meimaris, Department of Communication and Media Studies, National and Kapodistrian University / University of Athens	7,5	225
X3	Title : Design of Mathematics and Science Curriculum Programs Instructors : Sonia Kafoussi, Ioannis Hadzigeorgiou Guest seminars : Professor Constantinos Christou, Department of Education, University of Cyprus	7,5	225
X4	Title : Design, development and assessment of ICT applications for teaching and learning Instructors : Georgios Fessakis Vasileios Komis	7,5	225
	TOTAL	30	900
E1	<b>B Semester</b> <b>Title</b> : Models of Integrating I.C.T. in the educational systems and their Didactics. <b>Instructors</b> : Aggeliki Dimitrakopoulou	7,5	225
E2	Title : Design and Assessment of Educational Material in the Didactics of Mathematics and Science Instructors : Michael Skoumios Guest seminars : Basiliki Xatzinikita	7,5	225
E3	Title : Research Methods in Didactics and Learning of Mathematics and Science with I.C.T Instructors : Aggeliki Dimitrakopoulou Georgios Fessakis	7,5	225
E4	Title : Dissertation beginning Instructors : Fragiskos Kalavasis George Kritikos Andreas Moutsios-Rentzos Guest seminars : Lenzen Dieter	7,5	225
	TOTAL Summer Term – Dissertation completion <ul> <li>Theoretical treatment</li> <li>Processing Hardware</li> <li>Design composition / research / experiment</li> </ul>	<b>30</b> 15	<b>900</b> 450
	OVERALL TOTAL	75	2250

The postgraduate students are obliged to attend all activities of the Postgraduate Study Programme. The postgraduate student who attended a course less than 80% of the planned teaching hours per semester is considered failing undersigned in this course and is required to attend in the next corresponding period.

The examination periods are twice a year, at the end of each semester, while an additional examination is in December.

#### **DESCRIPTION OF COURSES**

A Semester

#### X1 Didactics of Mathematics and Science: An interdisciplinary approach

This course is designed to provide a functional understanding of Didactics of Mathematics and Science and to highlight the interdisciplinary essence and the sociocultural breadth of its concepts and methods.

In particular the course investigates the relationship of the evolving learning processes with the scientific construction of concepts and theories in Mathematics, as well as with the conceptual and methodological development in Science. In which ways are the school context and the didactical contract, the multiple roles of the representations/constructions, the intuitive certainties and the epistemological obstacles, the errors and the paradoxes of logic, the conventions of meanings and expressions linked within the complex learning schema and the reflectrive construction of mathematics and scientific concepts?

Through the investigation of this relationship it is revealed the way that alternative and/or erroneous scientific conceptions are formed, as well as the way that theses conceptions are maintained, reproduced and disseminated in educational and social practices.

The intention of the course is to identify and to understand the difficulties and the potential of the design and didactical management of the transformations that characterise a didactical situation.

The teamwork projects about the interdisciplinary approach complement the students' systematic engagement in activities about problem-solving and didactical situations with reference to the school curricula of all levels.

#### X2 Modern Theories for Learning and Organization of Educational Structures

The general aim of the course is the deepening in issues of learning, organization and development of educational structures, providing emphasis on theories of complexity and difference as well as on their pedagogical implementation in different organizational and functioning levels of the Greek educational system.

#### For the modules developed by Prof. A. Kodakos.

The first part of the course focuses on the systemic approach of the phenomena, structures and processes of learning and knowledge. Furthermore, the following specific objectives are discussed:

- 1. Delimitation and interfaces of learning sector of school development.
- The conceptualization of basic systemic terms of learning and organization in different fields of complexity (system, organization, structure, communication, memory, knowledge, intelligence).
- 3. The organization, management and reproduction of educational structures, processes and learning environments.
- 4. The development of individual and organizational learning models in complex educational environments.
- 5. The development of an anthropological, social and cultural well-founded perception of learning processes and structures.
- 6. The development of technology, the association of roles, structures and learning environments.

#### For the modules developed by Assist. Prof. P. J. Stamatis.

The high demands for a modern education, leading to a radically different view of development and improving of structures and learning procedures. In the framework of the second part of this course which is consisted by five modules instructed by Assistant Professor P. J. Stamatis, approaches of learning theories and their impact on modern-school education system are developed as parts of their influences in modern educational system and specifically to the fields of teaching, staff development, school leadership/management school and school climate. Consequently, the purpose of these modules is the understanding of the learning processes in all levels of a school unit. Generally, under these themes, seeking:

- 1. The conceptual clarification of basic pedagogical terms
- 2. An overview of the learning process

- 3. The approach of the main theories and models of learning
- 4. Understanding the effects of learning theories in modern education

5. The proposals for the development of strategies for improvement of modern learning process

#### X3 Design of Mathematics and Science Curriculum Programs

The goal of the course is the discussion about critical elements of the design of Mathematics and Science Curriculum.

#### **Course contents (Syllabus)**

- Historical elements about the development of Mathematics and Science Curriculum Programs (19<sup>th</sup> και 20<sup>th</sup> century)
- Basic principles of the of Mathematics and Science Curriculum Programs:
  - -Epistemology of the subject
  - Scientific Literacy and its implications for curriculum design
  - Contemporary approaches in Didactics of Mathematics and Science
  - Sociocultural elements (values, family)
  - Sociopolitical issues (school classroom identity)
  - Examples of Curriculum Programs

#### X4 Design, development and assessment of ICT applications for teaching and learning

The course "Design, development and assessment of ICT applications for teaching and learning" refers to the development of the capability to enhance teaching and learning of Science, Technology, Engineering and Mathematics (STEM) by integrating of ICT in the educational practice, applying approaches grounded on research and modern learning theories. Students who complete the course successfully will be able to design ICT learning scripts and interventions for K12 STEM courses, to orchestrate and implement integrated cross-curricular/interdisciplinary learning experiences with ICT, to develop and enrich curricula using ICT, and to evaluate curricula and ICT applications for teaching and learning. Generally they will be able to develop theoretical and practical capacities in learning design with ICT under the view of interdisciplinary and cross-curricular approach. Furthermore, the students will develop research skills for issues of STEM Education and ICT taking an interdisciplinary point of view.

#### E1 Models of Integrating I.C.T. in the educational systems and their Didactics.

The course develops learning and teaching ICT environments with emphasis on categories of software and ICT applications in the relations of learning theories to the approaches of the Teaching of ICT, applications in the design, pedagogical practices manual and differential teaching management and evaluation. The course is part multidimensional issue of integration, integration and use of ICT in education systems.

Through a historical review will develop ICT integration in education models (technocrats, Integrated, pragmatics). The students will study standards and positions of international organizations on the use of ICT in education, analyze comparatively the efforts of different countries to integrate ICT in education and general national and European policies, will record practical approaches for ICT applications design, these educational management in practice and finally evaluation.

## E2 Design and Assessment of Educational Material in the Didactics of Mathematics and Science

The purpose of this course is the systematic conformation of design, creation, use and evaluation procedures of instructional tools and learning materials for mathematics and science.

At the end of the course students should be able to: (a) report the new perspectives in mathematics and science education, (b) analyse the historical and contemporary meanings of mathematics and scientific literacy and their relationship to mathematics and science education reforms, (c) identify the mathematics and science practices, the crosscutting concepts, the core ideas in mathematics and science and analyse the meaning of the term "three dimensional" mathematics and science learning, (d) report and analyse the research-based claims relating to students' conceptions about mathematics and science concepts and describe the main features of students' conceptions, (e) identify and analyse the approaches for mathematics and science teaching, (f) explain the basic principles of constructivist learning in mathematics and science, (g) analyse the meaning of inquiry-based learning in mathematics and science and identify its essential features, (h) report and analyse design strategies for developing mathematics and science instructional materials, (i) discuss about science

education and interdisciplinary approaches, (j) design and develop mathematics and science instructional materials, and (k) assess mathematics and science instructional materials.

#### E3 Research Methods in Didactics and Learning of Mathematics and Science with I.C.T.

The course aims to link research to the learning activity within technological environments teaching of Mathematics and Science. The aim is to give students basic skills to design individual or/ and collaborative research-action projects and technological environments for developing teaching models that include the investigation of learning situations in multiple fields [group, class / department, School Unit , Education Center, Center for creative activities, sub-area educational systems of units, Region, Territory, and Executive Education programs or Education, Training Trainers etc.]. With emphasis on epistemological peculiarities of Mathematics and Science should be totally able to understand the psychological, cultural, social, political and economic aspects and implications within the learning processes, teaching and design in a variety of educational settings and contexts, and in various conditions of everyday life. You will develop a historical approach general trends and examples in researchaction methodology (categorization research questions Categorizations-Research Methodologies Research and correlations with Learning Theories and Philosophical examples. Modern research problem and methodology trends.). With particular emphasis on the use of ICT, observation and mikro -teaching will become critical analysis of the adequacy of interdisciplinary analysis on the factors involved in the research-action and on eco-systemic view parameters in complex and multifactorial conditions proximity actual life, diverse learning environments.

#### E4 Dissertation beginning

This course intends to provide deeper understanding about the epistemological and the educational importance of the links between research and teaching, which characterize the theoretical production and the pedagogical innovation of the Didactics of Mathematics, Science and ICT in education, as well as to highlight the scientific theoretical focus shifts.

In order to comprehend these links, the analyses concentrate in the meanings and the techniques employed to identify the multiple aspects, roles and actions of a didactical situation, as well as in their evolvement rate and interaction during the construction of the scientific concepts and the representations of the scientific activity and of the interdisciplinary links.

Within this context, the importance of the systemic perspective is analysed and the significance of constructing diagnostic-evaluation tools that crucially include the links and the aspects, the roles and the actions in the design, synthesis and reporting of a dissertation and of a didactical proposal in accordance with the standards of the contemporary scientific community is highlighted.

#### **Dissertation completion**

Purpose is the synthetic completion of studies and the ability to design, development, evaluation, writing and oral support of a pedagogical project in the broadest sense developed in this field. The intention of the Dissertation is for the students to understand the meanings and the techniques of scientific collaboration and involvement in the theoretical and empirical validation and the development of innovative research results or (and) in the investigation of new areas of application of innovative research results in Didactic of Science and ICT.

The completion of the Dissertation implies the acknowledgement of, on the one hand, of the individual ability of each student to for epistemological synthesis, technological integration and pedagogical adaptation of research results and of, on the other hand, the ability to scientifically collaborate, write and orally support the dissertation in accordance with the standards of a scientific announcement.

#### **OTHER RESEARCH AND TEACHING ACTIVITIES**

The postgraduate Student which : (a) is registered in Postgraduate Study Programme for the award of Master of Science Degree in "Didactics of Mathematics, Science and Information and Communication Technologies in Education: Interdisciplinary Approach", (b) has attended one (1) calendar semester in Postgraduate Study Programme, and (c) has been examined successfully in four (4) graduate courses, can be moved by up to six months in order to carry out part of his studies at a university in the country or abroad.

#### **PARALLEL INSTITUTIONS**

#### LIBRARY

The **Annex Library of Rhodes** is situated in the 1<sup>st</sup> Floor of the Kleovoulos building. The public service hours are: Monday, Thursday: 08:00 - 18:00, Tuesday, Wednesday, and Friday: 08:00 - 15:00 Right to borrow in Library, material of Library University of the Aegean have only members of the University of the Aegean.

A prerequisite for the exercise of this right is to own card user library. In case of loss of the card, the user is required to immediately notify the library staff.

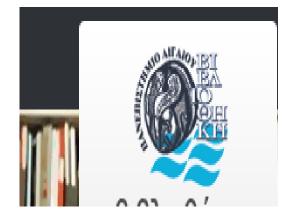
The borrowing time for the remaining material of the Library are:

a) For teachers, Postgraduate students, 15 days.

 b) For undergraduate students and administrative staff of the Foundation, a week.

In exceptional cases the Responsible of the library may recall the loan books have great demand.

The systematic withholding Library materials by any user and



the late return that means a temporary suspension of the right loan for six months, following a decision of the Local Committee Library.

The late return brings fine proportional to the days of unlawful interception. The fine set by the Central Library of the Committee at the beginning of each academic year.

Anyone student who has outstanding lending Library fails to take delivery rating and participate in swearing.

### **STUDENT WELFARE**

Postgraduate Student that they have completed enrollment normally have the rights for

- free meals
- full health care.

Further information may be found in <u>https://studies.aegean.gr/node/171</u>.

Entry to the system is the use of e-mail accounts of the University to be issued to Postgraduate students.

Young Postgraduate students and doctoral students will submit their requests upon registration.

## **FELLOWSHIPS**

Presidential Decree 160/2005 provides the possibility of granting scholarships to graduate students.

The scholarship is considered the award once per calendar year, an amount not exceeding 1000 euro provided that they have found funding from another source support Postgraduate Student Programme.

Scholarship awarded to graduate students of M.Sc. with the best performance under general grade diploma of Postgraduate Study Programme of corresponding study year by decision of The General Assembly of Special Composition which could define any obligations of fellows.

The Postgraduate Student who receive a scholarship from a source to support their studies in P.S.P. is obliged to declare to the Secretariat of the PSP.

Postgraduate Students receiving a scholarship from the State Scholarships Foundation or another agency or entity cannot be awarded PSP Scholarship.

In the case that a postgraduate student participates in a paid program of the Special Research Account University of the Aegean, he/she may apply for the scholarship provided that the fee is less than the amount of the scholarship is announced.

#### **PROGRAMME ACADEMIC YEAR 2014-2015**

The Presidential Decree 160/2005 provides the possibility of granting scholarships to Postgraduate Students.

The scholarship is considered the award once per calendar year, an amount not exceeding EUR 1000 provided that they have found funding from another source support Postgraduate Study Programme.

Courses and seminars take place in Rhodes, at the premises of the Faculty of Humanities, University of the Aegean. The program is structured in an intensive courses (modules) per month, use and non-working days so it can also serve students with case bound professionally in other areas of the country.

The Duration of the Postgraduate Study Programme shall be two semesters full-time. The first half corresponds to the spring semester of the academic year 2014-2015 and the second half corresponds to the fall semester of the academic year 2015-2016.

The courses in Postgraduate Study Programme starting the first half of February, following the terms of an intensive curriculum of two semesters (1st and 2nd) and a dissertation, totaling 46-52 weeks and not provided student holidays (FEK 1466, 13.8.2007, Article 1, par3).

Each semester consists of thirteen (13) weeks of classes and two (2) weeks of examinations. The dissertation is prepared and completed in two periods total duration 22 weeks, the summer period 8 weeks and the winter for 14 weeks.

## **CV OF FUCULTY**

Fragkiskos Kalavasis Professor Dept of Sciences of Preschool Education and Education Design University of the Aegean Director and Scientific Coordinator of P.S.P.	Fragkiskos (Francois) Kalavasis is a Mathematician with Master studies and PhD Thesis in the Didactics of Mathematics at the University of Athens (Departement of Mathematics) and at the University of the Aegean since 1989, he has been collaborated with the Greek University of the Aegean since 1989, he has been collaborated with the Greek University of the Aegean a visiting professor. His scientific work since 1980 is in the field of Didactics of Mathematics with an emphasis on the interaction between the representations and the comprehension of mathematics and which way this interaction can be integrate in the educational Design to improve the construction of mathematical concepts and of learning models. From this point of view he has drawn his approach in the Didactical Engineering and the Learning Technologies. During the last 10 years he is dealing with the Systemic Models of the Learning Structures (Persons, Collectivises and Organisms) and their application in the governance of School Units. He has published more than 100 scientific papers in Greek and International journals, he has edited many scientific volumes and he has been scientific responsible international research programmes (Erasmus, Tempus, Interreg II & III). He has organised national and international scientific conferences and research meetings. Moreover, he was, for a number of years, the President of the Editing <i>Society "Euclides g"</i> , and he is the Chief Editor of the INTERNATIONAL SCIENTIFIC JOURNAL JOURNAL FOR MATHEMATICS IN EDUCATION (HMS I JME, http://www.hms.gr/node/261). He has been the President of the Department of Sciences for Pre-school Education and Educational Design (2002-6) of the University of the Aegean as well as President of the Presidents' Assembly of the Pedagogical Departments of Greece and Cyprus (2003-2006) and the Dean of the School of Humanities, University of the Aegean, in which he has supervised 5 phd thesis in the field of Didactic of Mathematics. He has been elected in the Executive of the Hellenic Mathematic
Anastasios Kodakos Professor Dept of Sciences of Preschool Education and Education Design University of the Aegean	He studied at the Pedagogical Academy of Tripolis, Peloponese (1981) and completed his postgraduate studies in Germany (1992). There, he studied Pedagogy and Philosophy, in Department of Philosophy Stuttgart University, Germany, PhD Degree, where he wrote his doctoral thesis on the topic: <i>«Menschen Brauchen Mythen. Studie zum Bildungswert des Mythos».</i> He taught as "Representative Instructor" in the Department of Philosophy, University of Stuttgart. From 1995 to 1998, he served as teacher "PD 407/80" in the Department of Early and primary Childhood Education at the University of the Aegean on Rhodes Island. In 1998, he was elected as "Assistant Professor", in 2003 as "Associate Professor" and in 2007 as "Professor" in the Department of Early Childhood Education at the University of the Aegean, in Rhodes. The courses, which he teaches are: I. At

undergraduate level: The History of Education, Introduction to Pedagogy,

Pedagogy / Intercultural Communication, History of Pedagogy, Theories and Models of School Development. **II.** At postgraduate level: Master's Program "Models of Educational Planning and Development" the courses "Communication Issues in Management and Education" as well as "Theories and Models of Educational Planning".

His research interests are: The History of Education; Systematic Pedagogy; Non-Verbal Behavior, Adult Education; European educational Policy; Pedagogy of Media; School Development; Educational Planning; Teacher Training.

He has presented at numerous International and Greek conferences.

He is the Director of Master's Degree "Models of Educational Planning and Development". He has served as "Kosmitefon" in S.A.E., President and Vice President of the "Teaching" in Department of Early Childhood and Educational Planning, Director of Regional Training Center (P.E.K.) in Piraeus, Board Member of Institute Diaspora Education and Intercultural Education (I. $\Pi$ .O. $\Delta$ .E.). He is Vice president of the Board of the Greek Society of Historical Education, Member of ISCHE (International Standing Conference for the History Education), Editor of the magazine Greek Society for the Historians of Education (G.S.H.E.), Scientific Advisor of the prestigious German magazine ZfE (Zeitsschrift für Erziehungswissenschaft), Verlag Leske und Budrich, Opladen

Angelique Dimitracopoulou is Professor ["Design of Technology Based Learning Environments"] of the School of Humanities, University of the Aegean, in Greece. She is also foundational member of the Learning Technology and Educational Engineering Laboratory (LTEE lab; <u>http://www.ltee.org</u>). She holds a degree in Physics Sciences (Univ Patras, Greece, 1986), Master and PhD in Information and Communication Technologies in Education (Univ. of Paris 7, France, 1995).

The last decade, in the level of pre-graduate studies she teaches, in the Department of Sciences of pre-school Education and of Educational Design (TEPAES Department) University of the Aegean, courses related to the Information and Communication Technologies (ICT) in Education [Introduction to the exploitation of ICTs in subject matters teaching, Models of ICTs integration in Education, Evaluation of educational software, Course-Research: Learning and technology based learning environments, Course-Practice: implementation of Technological environments in pre-primary school practice]

She also teaches in Master degrees programs. The last years in (i) University of Aegean/ TEPAES Department [Master programs: "Models of Educational Units' Design", & "Educational materials", (ii) University of Athens (Master program: "Application of Computer Sciences in Education", Teaching of Subject matters supported by ICTs"/ Course: Distance Education, (iii) University of Piraeus, Master: Didactics of ICTs/ Course: Evaluation of e-learning educational programs, and (iv) University of Thessalia, Master "Digital and Natural Educational Material"/ Course: Evaluation of educational software.

In parallel, she emphasizes in Teachers' Education, coordinating or participating in programs related to ICTs in education, for educators of n-service teachers (e.g. programs organized by University of the Aegean, University of Athens, etc).

Finally, she was the supervisor of 8 PhDs, which six of them have been successfully completed, while the rest of them are in progress

She is the author of more than 130 scientific publications related to: (a) the design of technology-based learning environments (modelling systems, intelligent tutoring systems, collaborative systems, computer based interaction analysis), most of them concern the field of sciences education; (b) the implementation of ICTs in genuine educational contexts; in a large variety of levels of education (from preprimary school to vocational education), as well as to (c) the Educational Policy concerning ICTs in Education (in a national level), and (d) teachers' education via communities of learning.

During the last five years she has focused on collaborative technology based learning environments, while she works intensively on computer based Interaction Analysis supporting technology based learning activities participants' self-regulation.

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Angelique Dimitracopoulou Professor Dept of Sciences of Preschool Education and Education Design University of the Aegean

#### International Scientific Community:

She was active member in: (a) scientific associations [IFIP Representative of Greece, TC3 group, 2002-2005; ISLS–CSCL (executive committee, 2004), (b) scientific networks (Kaleidoscope Network of Excellence: Core group member (2006-2007). (B) She is also member of editorial board in scientific journals and reviewer in book series. She was member of the program committee in international congresses (CSCL congresses, AIED congresses, CELDA congress, etc). (C) She has also organised extended workshops, symposia and summer schools as well as thematic workshops in the frame of established congresses. She is the chair of the upcoming CSCL2009 congress (Computer Supported Collaborative learning). **Hellenic Scientific Community:** 

(A) She is foundational member of three scientific associations (HICTE/ Hellenic Association for ICTs in Education; Hellenic Association of Open and Distance Learning, E-Network ICTs in Education for teachers), Secretary and Vice-President of HICTE (2002-2004 & 2004-2006 respectively). (B) She was the chair of one Hellenic congress with international participation, member of steering committee of 8 congresses and member of program committee of 6 other congresses. She was also the coordinator of a committee on ICTs in Education, of the Institute for Primary Education (IPEM-DOE: 2004-2005). (C) She is member of evaluation – selection boards of Researchers- Professors in various Universities in Greece. She was member of the Committee of Educational Software Evaluation methodology, in Hellenic Pedagogical Institute (1999-2000). Finally, she is member of PhD evaluation board in various Departments of Universities in Greece

More information about the work of Angelique Dimitracopoulou is available at Website: <u>http://www.ltee.gr/adimitr/</u>

	website: <u>http://www.itee.gr/adimitr/</u>
Ioannis Hadzigeorgiou Professor Dept of Sciences of Preschool Education and Education Design University of the Aegean	<ul> <li>Professor of the department of Sciences of Preschool Education and Education Design, School of Humanities, University of the Aegean with the field of "Development of Conceptual Representations in Preschool Age &amp; Applications to Curriculum".</li> <li>EDUCATION</li> <li>University of N. Iowa, U.S.A., DEd in Curriculum &amp; Instruction, 1994.</li> <li>University of Leeds, England, MEd in Education, 1987.</li> <li>University of Leeds, England, MSc in Biomechanics, 1986.</li> <li>Aristotelian University of Thessaloniki, Greece, BSc in Physics, 1981.</li> <li>ACTIVITIES</li> <li>Professor, School of Education University of the Aegean, 2008-present.</li> <li>Undergraduate, Graduate and Professional Development courses on: Curriculum Theory, Early Childhood Science Education, Instructional Design</li> <li>2)Professor in Postgraduate Student Programs of the department of Sciences of Preschool Education and Education Design : "Children's Books and Educational Material" and "Modeling Design and Development of Educational Units" in objects "Science and Educational Material" and "Models Evaluation of Educational Systems", and in Postgraduate Student Programme of Department of Philosophy, Education and Psychology, the Graduate Program Athens University PLANNING AND ASSESSMENT OF EDUCATIONAL PROJECT the course "Design Curricula."</li> <li>3) Member of the research team in the programs: a) Imaginative Education (Simon Fraser University, Canada) b) Inclusive Science Education (Midwestern Alliance in Science, Technology, Engineering and Mathematics- University of N. Iowa, USA)</li> <li>4) Participation in advisory committees diplomatic and doctorates.</li> <li>5) Referee (reviewer) in magazines Journal of Research in Science Teaching and Science Education Review and Environmental Education Research.</li> <li>6) Member of the Editorial Board: International Inversal of Environmental and</li> </ul>

Sonia Kafoussi Professor Dept of Sciences of Sonia Kafoussi is a Professor at the Department of Sciences of Preschool Education and Educational Design, University of the Aegean, in Didactics of Mathematics. She is a member of the International Commission for the Study and Improvement of

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Preschool Education and Education Design University of the Aegean

Chrysanthi Skoumpourdi Associate Professor Dept of Sciences of Preschool Education and Education Design University of the Aegean

Georgios Fessakis Assistant Professor Dept of Sciences of Preschool Education and Education Design University of the Aegean

Panagiotis J. Stamatis Assistant Professor Dept of Sciences of Preschool Education and Education Design University of the Aegean Mathematics Education (CIEAEM). She has published a lot of papers in international and greek journals and conferences. She is an author of the books «Children's mathematics 4-6 years old. Numbers and Space» (in collaboration with Chrysanthi Skoumpourdi, 2008) and «Classroom, family, society and mathematics education» (in collaboration with Petros Chaviaris, 2013). More information: <a href="http://www.ltee.gr/kafousi">http://www.ltee.gr/kafousi</a>

Chrysanthi Skoumpourdi is Associate Professor in the Department of Sciences of Preschool Education and of Educational Design (University of the Aegean, in Rhodes, Greece, in the field of "Didactics of Mathematics: Designing Educational Material". She has published scientific papers in International and Greek journals, in proceedings of International and Greek Conferences, on websites, as well as in International and Greek collective volumes. She is the author of a scientific book and co-author of two others. She has participated in scientific research programs and is a member of scientific associations and a member of scientific journals' editorial board. Her main research interests are about the design, development and management of educational materials and games for teaching / learning of primary school mathematics.

**Dr. Georgios Fessakis** holds a B.Sc. in Informatics, a M.Sc. in Advanced Informatics Systems from N. C. University of Athens and a PhD in Informatics Didactics from University of the Aegean. He has many years of extensive experience as a researcher and as computer science teacher in secondary public schools. Georgios is teaching ICT and learning technology related courses at the University of the Aegean since 2004 as adjunct lecturer (2004-2007), as elected lecturer (2007-2012) and currently as assistant professor since 2012. During all these years Georgios has published several articles in international and Greek journals and conferences. He also has participated and directed national and international research and development projects. His main research interests include ICT design and development for learning, ICT, Mathematics and Science Didactics, Intelligent systems, CSCL etc. Detailed information at: <a href="http://ltee.org/gfesakis/?page\_id=115&lang=en-us">http://ltee.org/gfesakis/?page\_id=115&lang=en-us</a>

Dr. Panagiotis J. Stamatis was born in Rhodes island Greece. Initially, he studied the Sciences of Education in Pedagogical Academy of Mytilene, and then he continued his studies in Dept. of Preschool Education and in Dept. of Primary School Education, University of the Aegean. Also, he studied in Teachers' Training Center "Alexander Delmouzos", University of the Aegean, where he completed a two-year cycle of Further Teaching Training in Primary Education. On 2003, in the Department of Sciences of Preschool Education and Educational Design, University of the Aegean, he completed his PhD studies with honors in Pedagogical Communication (with emphasis on non verbal communication in preschool education).

Since 1989 to 2012 he worked in Primary School Education, reaping a great teaching and administrative experience. He left Primary School Education while he was a School Counselor. In 2014 he was elected and appointed at the rank of Assistant Professor in the field of "**Communication in Preschool and Early Primary School Education**".

Except of primary schools he has taught for many years in the Department of Sciences of Preschool Education and Educational Design, University of the Aegean (P.D. 407/80), in the Primary School Teachers' Training Center "Alexander Delmouzos" and Preschool Teachers' Training Center "Konstantinos Karatheodori", University of the Aegean, in the Program for Postgraduate Studies (MA) in "Environmental Education", Dept. of Sciences of Preschool Education and Educational Design, University of the Aegean, in the Program for Postgraduate Studies (MA) in "Models of Planning Development of School Units", Dept. of Sciences of Preschool Education and Educational Design, University of the Aegean, in the Interdepartmental-Interuniversity Program for Postgraduate Studies (MA) in "Psychoeducational of Inclusion: A school for all", of the Aristotle University of Thessaloniki and University of the Aegean.

He has also taught in the School of Pedagogical and Technological Education

	(ASPETE), in the Program for the Academic Improvement of Preschool Education Teachers, University of the Aegean, in Training Programs for Preschool, Primary and Secondary School Teachers and Trainers conducted by the Regional Training Centre (PEK) of Piraeus, by the Greek Pedagogical Institute, by the Teachers' Training Organization (O.EP.EK.), by the Teachers' Training Program in Special Education of Univ. of the Aegean, by the Institute of Continuing Adult Education (IDEKE), or by the Inter-Balkan Institute of Public Administration (D.I.D.D.) Furthermore, he has participated in conferences as delegate and as a member of many scientific and organizing committees, he has participated in educational and research projects and programs, he has published pedagogical books, himself or in collaboration, he has published numerous articles in Greek and international journals, conference proceedings, books, magazines and other printed matters, he is reviewer in Greek and international journals, and he has given lectures in various institutions, clubs and at the Universities Freie-Berlin, Potsdam, Hamburg and Tübingen. He has honored for his writings and participation by local authorities and institutions, where he is active for many years, as he has been President or/and Member of Municipal Organisms related to Education and Culture. Also, he has been Member of many Committees, Associations, Libraries or other services regulated by Municipal Authorities or supervised by the Greek Ministry of Education and Religious Affairs. He is a member of the Greek Pedagogical Association. He is married and father of two sons.
Michael Skoumios	Michael Skoumios is Assistant Professor of Science Education at University of the
Assistant Professor Dept of Sciences of Preschool Education and Education Design University of the Aegean	Aegean (Department of Primary Education). He obtained a first degree in Physics from the National and Kapodistrian University of Athens, a second degree in Education from the University of Aegean and his PhD in Science Education from the Hellenic Open University. His research interests include science concept learning and teaching science in primary and secondary schools as well as the analysis and development of educational materials. He has published a considerable number of research papers in journals, books and conference proceedings.
Vassilis Komis	Vassilis Komis born in Viannos, Heraklio, Crete (1965). Holder of a degree in
Professor in the Department of Educational Sciences and Early Childhood Education of the University of Patras	<ul> <li>Mathematics from the University of Crete (1987), DEA (1989) and doctoral degrees (1993) in Teaching of Computer Science (Didactique de l'Informatique) from the University of Paris 7 - Denis Diderot (Jussieu).</li> <li>Vassilis Komis is currently a Professor in the Department of Educational Sciences and Early Childhood Education of the University of Patras and Head of this department. His publications and research interests concern the teaching of computer science, the integration of ICT in education, the conception and the development of educational software, Collaborative Learning, Teachers Training, and Mobile Learning.</li> </ul>
Dr Andreas Moutsios-Rentzos , PhD University of Warwick	Andreas Moutsios-Rentzos holds a PhD in Mathematics Education (University of Warwick), M.Sc. in Mathematics Education (University of Warwick) and Ptychio (4- year BSc) in Mathematics (National and Kapodestrian University of Athens). He has been teaching and taught Mathematics Education related courses in the University of the Aegean, the University of the Thessaly and the National and Kapodestrian University of Athens. His research interests span across various educational levels including: Cognitive dispositions, affect and strategies in Mathematics Education; Argumentation and Proof in Mathematics Education; Phenomenology in Mathematics Education; Systems theory and Mathematics Education; Topics in Communication in Mathematics Education. For a detailed CV and research account see <u>https://sites.google.com/site/moutsiosrentzos/</u> .
Dr. Coorgo Kritikos	Dr. George Kritikos was born in Rhodes in 1979. He holds a B.Sc. in Physics from
Dr. George Kritikos University of the Aegean	Aristotle University of Thessaloniki (AUTH) (2001), a M.Sc. in "Electronic Physics and Radioelectrology (Telecommunications)" from AUTH (2004), a M.Ed. in "Modeling Design and Development of Educational Units" from University of the Aegean (UoA) (2006) and a Ph.D. in Didactics of Physics using ICTfrom UoA (2013). He has been working inthe secondary education of Dodecanese as a Science Teacher since 2005. He has been the director of the Centre of ScienceLaboratory of

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the Southern Group of Dodecanese since July 2014. He is also a member of the Learning Technology and Educational Engineering Laboratory of UoA. He has published scientific articles in international and hellenic conferences, and in scientific journals.

	INVITED SPEAKERS
Lenzen Dieter Professor	The Dieter Lenzen is Professor of Philosophy of Education, President of the University of Hamburg (2010), Vice President of the Conference of Rectors of German Universities and a member of the Council of the European Universities Association. He has taught at the Free University of Berlin (1977-1990), where he was elected President (2003-9). He founded the journal Zeitschrift für Erziehungswissenschaft (Journal of Educational Studies) From 1986 to 1994 he was Visiting Professor at the Universities of Stanford, Columbia, Tokyo, Hiroshima and Nagoya. Conducts international programs for training and working with the P.S.P Modeling Design And Development Of Educational Units Dept of Sciences of Preschool Education and Education Design University of the Aegean. (Http://www.uni-hamburg.de/uhh/organisation/praesidium/praesident_e.html)
Professor Michael Meimaris director of the New Technologies Laboratory in Communication, Education and the Mass Media of the Faculty of Communication and Media Studies of the University of Athens.	Professor Michael Meimaris is the founder and director of the New Technologies Laboratory in Communication, Education and the Mass Media of the Faculty of Communication and Media Studies of the University of Athens. He is currently the Director of the University Research Institute of Applied Communication. He has studied Mathematics in the University of Athens and Statistics and computer based Data Analysis in Paris (University Paris VI Pierre et Marie Curie). His scientific interests involve the application of New Technologies in Communication, Education and the Mass Media, Graphics and Computer Animation, the New Technological Communication Environment and its design, Digital Storytelling, Intergenerational Communication and Learning, Visual Communication, Digital Game-Based Learning, Open and Distance Education, as well as the training of educators in the New Technologies field. He is a member of the International Committee and President of the National Committee of the Möbius Awards, member of the Scientific Board of the Maison des Sciences de l'Homme Nord of France, as well as of C.I.T.I. of the University of Lisbon and member of the jury of the French Laboratories of Excellence action of the French National Research Agency (ANR). Since 2014 he is a member of the UNESCO Institute for Information Technologies in Education (IITE). He has been awarded <i>Chevalier de l'Ordre des Palmes Académiques</i> of the French Democracy.
Constantinos Christou Professor of mathematics education at the University of Cyprus	Constantinos Christou is professor of mathematics education at the University of Cyprus. He is the president of the Governing Body of the Open University of Cyprus. Constantinos Christou served as the president of Cyprus Council for the Recognition of Higher Education Qualifications (Ky.S.A.T.S), vice president of the Accreditation Council of Cyprus (S.Ek.A.P) and President of the Cyprus Scientific Council.He was an elected member of the board of "European Society for Research in Mathematics Education". He was appointed as the coordinator of the committee for the development of new mathematics curricula in Cyprus and the new teaching material. He has published more than 100 books, book chapters, journal articles and conference proceedings. He is a reviewer of scientific journals in mathematics education. He participated as coordinator and partner in four European research projects and was the coordinator of five other research projects funded by the University of Cyprus, the Cyprus Research Foundation and Leventis Foundation. He was the National Representative of Cyprus in the TIMSS 2003 research study and PISA 2012. He participates in the European project KeyCoMath.
Vassilia Hatzinikita Professor Hellenic Open University	Professor Vassilia Hatzinikita is currently Dean of School of Humanities in the Hellenic Open University, Academic Director of the Master in Education and Coordinator of the postgraduate module Educational Research in Action. Her fields of expertise and research interests include educational research methodology, scientific literacy - PISA, science education, science textbooks, students' images of

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	science and scientists, analysis and development of educational (e-)materials. She has published an important number of research papers in peer-reviewed journals, books and conference proceedings and has developed teaching material for the Master's in Education. She has participated in a great number of research programs and has been member of the Board of the Greek Education Research Centre and of the Greek Teacher Training Organisation. She has also been a member of the panel of experts in the working group "Mathematics, Science and Technology" of the EU, Greece's National Representative in the European Network of Policy Makers for the Evaluation of Education Systems, member of the PISA Governing Board and National Project Manager of the PISA.
Anastasios	Tassos Kyprianidis. Has a diploma in Electrical Engineering (Dipl. Ing.) from the
Kyprianidis	Electrical Engineering Department (1974) and a Ph.D in Physics (Dr. rer. nat.) from
Researcher,	the Mathematics and Physics Department (1979) of the Technical University RWTH
Business	Aachen in Germany.
Consultant	He has served a a Scientific Assistant in the Theoretical SolidState Physics Institute(1974-76) and the Electrical Engineering Materials Institute (1974-1975), Assistant Lecturer in the Theoretical SolidState Physics Institute of RWTH Aachen (1976-79), Lecturer in the Physics Department of the University of Crete (1981-83) where he taught among others History and Philosophy of Physics, and visiting Fellow at the Henri Poincare Theoretical Physics Institute of the CNRS in Paris (1983-1988), working on basic research in theoretical and mathematical physics. From1986 to1988 he served as Editor's Assistant of the general Physics section of Physics Letters A (North Holland Publ. Co). Tassos has over 60 publicationsintheoreticalandmathematicalphysicsjournalsandisco-author (withD. Sardelis) of a book entitled "The Dynamics of Scientific Revolutions". He is currently active as Management Consultant.

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