



STUDY ENGINEERING IN PARIS THIS SUMMER

6 DIFFERENT CERTIFICATE PROGRAMS* TO CHOOSE FROM:

- Augmented and Virtual Reality
- Energy Efficiency Renewable Energies
- Energy Transition
- First Step in Creating an IoT Startup
- Operating Systems
- Web Application Development

* worth 8 or 9 ECTS credits

Dates: July 2nd, 2018 – July 26th, 2018

Deadline to register: May 15th, 2018

Contact: summer@pariseiffel.fr

<http://summer.pariseiffel.fr>

AUGMENTED AND VIRTUAL REALITY IN OUR SOCIETY, SENSORS AND NETWORK INFRASTRUCTURE

Certificate awarded by: ECE Paris

Welcome event: July 2nd, 2018 (morning) **Start date of courses:** July 2nd, 2018 (afternoon)

End date: July 26th, 2018 **Certificate Ceremony:** July 26th, 2018

Total ECTS: 8 **Total contact hours:** 72

Program requirement: a minimum 18 years of age

Program location: ECE Paris - 37 quai de Grenelle, 75015 Paris, France

Language of instruction: English

PROGRAM FEE: 1,850€

FEE INCLUDES:

- Orientation/Welcome Event
- Weekly cultural visits/activities
- Computer accounts at the school (WIFI access)
- Access to the school's MediaCenter
- Official transcript of grades
- Program Certificate
- Certificate Ceremony

PROGRAM OVERVIEW/OBJECTIVE:

Summary

What does it mean the term "Virtual and Augmented Reality" ?

What is the need of the "Virtual and Augmented Reality" in our Society ?

What is the future of the "Virtual and Augmented Reality" ?

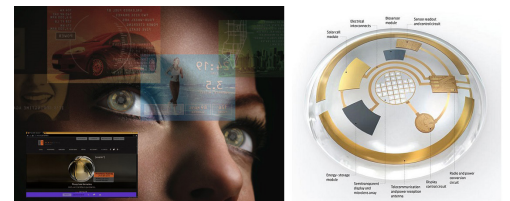
We will try by these lectures to give response to those questions, by presenting an exhaustive view of the Virtual and Augmented Reality domain, including a global view, a panorama of example, and a projection to the future.

Key words

Virtual and Augmented reality, Technology, 3D, Market, Network, Business Model

Official language

English (alternative explanation in French and Portuguese is possible)



CONTACT summer@pariseiffel.fr

PROGRAM COURSE LIST

| Course Title | ECTS (credits) | Contact hours | Level (undergraduate or graduate) |
|--|----------------|---------------|---|
| Augmented/Virtual Reality Introduction | 3 | 24 | Beginner, undergraduate's or graduates students and researchers |
| Augmented/Virtual Reality Products/ Projects and Future | 3 | 30 | Beginner, undergraduate's or graduates students and researchers |
| Augmented/Virtual Reality sensors network Infrastructure | 2 | 18 | Beginner, undergraduate's or graduates students and researchers |

Take into account to plan “External Visits”: This part includes a visit for an experimentation room for Augmented Reality : as CAVES, etc.

COURSE 1

| Course Title | Augmented/Virtual Reality Introduction |
|----------------------|---|
| Learning outcomes | <ul style="list-style-type: none">• How using technology as «VR/AR» can help us in our life ;• How it is easy to use this kind of technology |
| Pre-requisites | <p>This lecture provides a comprehensive introduction to the fields of Augmented Reality. No technical previous Knowledge is required.</p> <p>But a previous knowledge of 3D geometry fundamentals, or virtual reality and Object Recognition is a JOKER.</p> |
| Recommended readings | <p>TerraDynamica Project ; Build your own world “Vuforia™ Smart Terrain™”, KINECTS, CAVES, VRPN, FFAST, AUGMENTED RETINA</p> |

COURSE CONTENT:

Lectures

- Lecture 1: Module presentation
- Lecture 2: Virtual and Augmented Reality Introduction : history, definition, global view
- Lecture 3: How Virtual and Augmented Reality helps the Reality

Tutorials

This part it is organized by a set of demo using sensors (Kinects, IPAD with 3D sensors, etc) to test directly the using of Augmented Reality.

COURSE 2

| Course Title | Augmented/Virtual Reality Products/Projects and Future |
|----------------------|---|
| Learning outcomes | <ul style="list-style-type: none">• How to sell new applications in RA/RV : Business Model;• How to include new technology in your work to make it more productive |
| Pre-requisites | <p>This lecture provides a comprehensive introduction to the fields of Augmented Reality. No technical previous Knowledge is required.</p> <p>But a previous knowledge of 3D geometry fundamentals, or virtual reality and Object Recognition is a JOKER.</p> |
| Recommended readings | <p>TerraDynamica Project ; Build your own world “Vuforia™ Smart Terrain™”, KINECTS, CAVES, VRPN, FFAST, AUGMENTED RETINA</p> |

COURSE CONTENT:

Lectures

- Lecture 4: Virtual and Augmented Reality Applications : a panorama of product
- Lecture 5: Virtual and Augmented Reality Applications : a panorama of Research project
- Lecture 6: Virtual and Augmented Reality tools : the link with the industry of sensors
- Lecture 7: The future of the Augmented Reality

Tutorials

This part it is organized by a set of demo using sensors (Kinects, IPAD with 3D sensors, etc) to test directly the using of Augmented Reality.

COURSE 3

| Course Title | Augmented/Virtual Reality sensors network Infrastructure |
|----------------------|---|
| Learning outcomes | How monitoring the technological advances, is one of the keys of the success for RA/RV applications |
| Pre-requisites | This lecture provides a comprehensive introduction to the fields of Augmented Reality. No technical previous Knowledge is required. But a previous knowledge of 3D geometry fundamentals, or virtual reality and Object Recognition is a JOKER. |
| Recommended readings | TerraDynamica Project ; Build your own world "Vuforia™ Smart Terrain™", KINECTS, CAVES, VRPN, FFAST, AUGMENTED RETINA |

COURSE CONTENT:

Lectures

- Lecture 8: panorama and history of the using of sensors in AR and VR
- Lecture 9: Networks, Communications, Protocols : the infrastructure for success of AR and VR

Tutorials

In this part is organized by a set of demo.

ENERGY EFFICIENCY & RENEWABLE ENERGIES: LEVERS FOR ENERGY TRANSITION SUMMER SEMINAR

Certificate awarded by: ECE Paris: Graduate School of Engineering

Welcome event: July 2nd, 2018 (morning) **Start date of courses:** July 2nd, 2018 (afternoon)

End date: July 26th, 2018 **Certificate Ceremony:** July 26th, 2018

Total ECTS: 9 **Total contact hours:** 72

Program requirement: a minimum 18 years of age

Program location: ECE Paris – 37 quai de Grenelle, 75015 Paris, France

Language of instruction: English

PROGRAM FEE: 1,850€

FEE INCLUDES:

- Orientation/Welcome Event
- Weekly cultural visits/activities
- Computer accounts at the school (WIFI access)
- Access to the school's MediaCenter
- Official transcript of grades
- Program Certificate
- Certificate Ceremony

PROGRAM OVERVIEW/OBJECTIVE:

The seminar is composed of a set of 3 courses (3 x 24h, 3 x 3 ECTS). Its main objective is to provide students with engineering knowledge and techniques for understanding, assessing, and mitigating environmental issues associated with energy production, efficiency rating, storage, transmission, distribution, integration in existing portfolio, and consumption. The focus of this course is concentrated on the key role that energy efficiency and renewable energy are playing into the context of global energy transition.

Students will learn:

- Basic knowledge needed in order to understand today's energy and climate challenges;
- Basic theories of different technologies for energy efficiency and different sources of renewable energy technologies, energy transmission and storage;
- Basic theories and tools to perform feasibility studies related to implementation of energy efficiency solution and renewable energy production;
- Basic knowledge needed to quantify and evaluate any economic and environmental benefits associated to energy efficiency programs and solutions and renewable energy production project depending on the considered available source of renewable energy.

Successful student will be granted with a certificate

CONTACT summer@pariseiffel.fr

PROGRAM COURSE LIST

| Course Title | ECTS (credits) | Contact hours | Level (undergraduate or graduate) |
|---|----------------|---------------|--------------------------------------|
| Energy Efficiency and Renewable Energies in the context of Global Energy Transition | 3 | 24 | undergraduate |
| Energy Efficiency Technologies Portfolio | 3 | 24 | undergraduate |
| Renewable Energy Technologies Portfolio | 3 | 24 | undergraduate |

COURSE 1

| Course Title | Energy Efficiency and Renewable Energies in the context of Global Energy Transition |
|----------------------|---|
| Learning outcomes | <p>Students will learn basic knowledge needed in order to understand today's energy challenge.</p> <p>This course provide students with the basic knowledge needed for understanding, assessing, and mitigating environmental issues associated with energy production, efficiency rating, storage, transmission, integration in existing portfolio, and consumption.</p> |
| Pre-requisites | Fundamentals of Physics, Mathematics, Chemistry, Technology and basic knowledge in Socio-Geopolitics |
| Recommended readings | <p>The Politics and Institutions of Global Energy Governance by Thijs Van de Graaf.</p> <p>The Political Economy of Sustainable Energy by Catherine Mitchell.</p> <p>Energy and the Environment by Robert A. Ristinen & Jack P. Kraushaar.</p> |

COURSE CONTENT:

The course will be composed of 24h of face-to-face (lectures, tutorials or labs).

- Introduction: Getting Power to the People
- Universal access to energy as a path to sustainable development
- Global Energy Supply and Use in the Context of World Energy and Environment Transition
- Environmental and Economic Impacts of Fossil Fuels Consumption
- Energy Efficiency and Renewables as Levers for Energy and Environment Transition

COURSE 2

| Course Title | Energy Efficiency Technologies Portfolio |
|----------------------|---|
| Learning outcomes | <p>Students will learn basic knowledge needed to quantify and evaluate any economic and environmental benefits associated to energy efficiency in the different sectors (i.e. industry, transport, services, and building).</p> <p>This course provides students with engineering knowledge and technique for understanding, assessing, and mitigating environmental issues associated with energy consumption. It presents the major regulation tools, policy and tool and incentive programs for accelerating penetration of energy-efficiency solutions.</p> |
| Pre-requisites | Fundamentals of Physics, Mathematics and Chemistry |
| Recommended readings | Electric Power Generation, Transmission, and Distribution, Third Edition (Electric Power Engineering Series) Hardcover edited by Leonard L. Grigsby. |

COURSE CONTENT:

The course will be composed of 24h of face-to-face (lectures, tutorials or labs).

- Definition of Energy Efficiency
- Planning, Implementing and Evaluating Energy Policies and Solutions
- Implementing Energy Efficiency Action Plan with ISO 50001 International Standard
- Energy Efficiency Trends and Policies in Europe

COURSE 3

| Course Title | Renewable Energy Technologies Portfolio |
|----------------------|--|
| Learning outcomes | <p>Students will learn basic knowledge needed to quantify and evaluate any economic and environmental benefits associated to renewable energies in the different sectors (i.e. industry, transport, services, and building).</p> <p>This course provides students with engineering knowledge and technique for understanding, assessing, and mitigating environmental issues associated with renewables. It presents the major regulation tools, policy and tool and incentive programs for accelerating penetration of renewables. It also covers the challenges of high level of integration of renewables in the existing energy mix.</p> |
| Pre-requisites | Fundamentals of Physics, Mathematics, Chemistry, Technology and basic knowledge in Socio-Geopolitics |
| Recommended readings | <p>“The Geopolitics of Renewable Energy” by Meghan O’Sullivan et al,</p> <p>“Electric Power Generation, Transmission, and Distribution” by Leonard L. Grigsby,</p> <p>“Synergies Between Renewable Energy and Energy Efficiency” by IRENA</p> <p>“Adapting Market Design to High Shares of Variable Renewable Energy” by IRENA.</p> |

COURSE CONTENT:

The course will be composed of 24h of face-to-face (lectures, tutorials or labs).

- Renewable Energy Panorama and Perspectives
- Thermodynamic Principles and Energy Conversion
- Understanding Renewable Energy Systems : production, transmission, distribution and storage
- Integrating Renewables in the Energy System : Moving towards Smart Grids and Smart Networks
- The Cost of Renewable Energies and CO2 Emissions Intensity Comparison with Fossil Fuels
- Policies, Regulation and Market Design for Renewable Energies

ENERGY TRANSITION: PERSPECTIVES & OPPORTUNITIES SUMMER SEMINAR

Certificate awarded by: ECE Paris: Graduate School of Engineering

Welcome event: July 2nd, 2018 (morning) **Start date of courses:** July 2nd, 2018 (afternoon)

End date: July 26th, 2018 **Certificate Ceremony:** July 26th, 2018

Total ECTS: 9 **Total contact hours:** 72

Program requirement: a minimum 18 years of age

Program location: ECE Paris – 37 quai de Grenelle, 75015 Paris, France

Language of instruction: English

PROGRAM FEE: 1,850€

FEE INCLUDES:

- Orientation/Welcome Event
- Weekly cultural visits/activities
- Computer accounts at the school (WIFI access)
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- Official transcript of grades
- Program Certificate
- Certificate Ceremony

PROGRAM OVERVIEW/OBJECTIVE:

The seminar is composed of a set of 3 courses (3 x 24h, 3 x 3 ECTS). Its main objective is to provide students with engineering and socio-economic knowledge and techniques for understanding, assessing the energy transition system moving to clean energy in order to mitigate environmental and climate issues associated with energy production, transmission, distribution and consumption in existing portfolio.

Students will learn:

- Basic knowledge needed in order to understand today's energy and climate challenges;
- Basic knowledge on energy supply, transmission, distribution, storage and use;
- Basic knowledge needed in order to understand political economy of energy transitions;
- Basic knowledge needed to quantify and evaluate any economic and environmental benefits of energy transition policies and programs;
- Basic knowledge needed to benchmark different energy transitions policies.

Successful student will be granted with a certificate

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PROGRAM COURSE LIST

| Course Title | ECTS (credits) | Contact hours | Level (undergraduate or graduate) |
|---|----------------|---------------|--------------------------------------|
| Understanding “Energy & Environment” Issues | 3 | 24 | undergraduate |
| Energy Transition: Perspectives & Opportunities | 3 | 24 | undergraduate |
| Fostering Effective Energy Transition | 3 | 24 | undergraduate |

COURSE 1

| Course Title | Understanding “Energy & Environment” Issues |
|----------------------|--|
| Learning outcomes | <p>Students will learn basic knowledge needed in order to understand today’s energy and climates challenges.</p> <p>This course provides students with the basic knowledge needed for understanding, assessing, and mitigating environmental issues associated with energy production, transmission, distribution and consumption in existing portfolio.</p> |
| Pre-requisites | Fundamentals of Economics and basic knowledge in Socio-Geopolitics |
| Recommended readings | <p>“The Politics and Institutions of Global Energy Governance” by Thijs Van de Graaf.</p> <p>“The Political Economy of Sustainable Energy” by Catherine Mitchell.</p> <p>“Energy and the Environment” by Robert A. Ristinen & Jack P. Kraushaar.</p> |

COURSE CONTENT:

The course will be composed of 24h of face-to-face (lectures, tutorials or labs).

- Introduction: Getting Power to People
- Global Energy Supply and Use
- The Global Context

COURSE 2

| Course Title | Energy Transition: Perspectives & Opportunities |
|----------------------|---|
| Learning outcomes | <p>Students will learn about strategies, technologies, transition pathways to improve energy access and security in all sectors of activity, while ensuring environmental and socio-economic benefits in a sustainable way.</p> <p>This course provides students with a comprehensive vision of the energy transition system moving to clean energy, considering the challenge it represents in terms of integration of great share of renewable, R&D and innovation, financing schemes, costs and opportunities.</p> |
| Pre-requisites | Fundamentals of Economics and basic knowledge in Socio-Geopolitics |
| Recommended readings | “Global Energy: Issues, Potentials, and Policy Implications” by Paul Ekins, et al, “Renewables: The Politics of a Global Energy Transition” by M. Aklin and J. Urpelainen. |

COURSE CONTENT:

The course will be composed of 24h of face-to-face (lectures, tutorials or labs).

- Introduction to political economy of energy transitions
- Varieties of clean energy
- Innovative technologies to mitigate climate change
- IEA global low-carbon energy technology roadmaps
- Financing low-carbon energy strategies
- Energy transition benefits

COURSE 3

| Course Title | Fostering Effective Energy Transition |
|----------------------|---|
| Learning outcomes | <p>Students will learn about global benchmarking of energy systems highlighting topical energy issues and providing guidance on making energy transitions more effective.</p> <p>This course provides students with a clear comprehension of how countries can achieve balancing the trade-offs between energy access and security, energy equity, environmental sustainability with respect to socio-economic development.</p> |
| Pre-requisites | Fundamentals of Economics and basic knowledge in Socio-Geopolitics |
| Recommended readings | <p>“Benchmarking Sustainability of National Energy System” by World Energy Council,</p> <p>“Global Energy Shifts: Fostering Sustainability in a Turbulent Age” by Bruce Podobnik.</p> |

COURSE CONTENT:

The course will be composed of 24h of face-to-face (lectures, tutorials or labs).

- Introduction to assessment of energy transition efficiency
- Energy architecture performance index (World Economic Forum)
- World Energy Trilemma Index (World Energy Council)
- Energy efficiency and decarbonization strategies: intercomparison analysis between USA, China and Denmark

FIRST STEP IN CREATING AN IoT STARTUP

FROM THE IDEATION TO A 3D OBJECT

Certificate awarded by: ECE Paris: Graduate School of Engineering

Welcome event: July 2nd, 2018 (morning) **Start date of courses:** July 2nd, 2018 (afternoon)

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PROGRAM COURSE LIST

| Course Title | ECTS (credits) | Contact hours | Level (undergraduate or graduate) |
|----------------------------|----------------|---------------|---|
| Ideation and conception | 2 | 18 | Undergraduates or graduates students |
| Design 3D objects | 3 | 30 | Undergraduates or graduates students |
| Prototyping 3D object | 3 | 24 | Undergraduates or graduates students |

CONTACT

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PROGRAM COURSE DESCRIPTIONS

COURSE 1

COURSE OVERVIEW:

This is an intermediate level design thinking and business thinking course in which concepts and techniques will be studied in order to give an efficient process from finding the idea to the step just before prototyping. This class does not require previous knowledge, but more an open minded to new design concepts for an engineer. Upon completion of this course, students will have acquired an advanced knowledge of the process beginning « how to find a new startup idea » and finishing to « how to make a maquette to test my idea ».

More than a one shot process for only one idea, this course will bring students to the opportunity to be some new innovation ideas driver in big company as well as in a startup.

| Course Title | Ideation and conception : from the object to the service |
|-------------------|--|
| Learning outcomes | Learn how to use the different process to : <ol style="list-style-type: none">1. Use design thinking2. Use business thinking3. Define a functional and a close to a final object4. Challenge their finds |
| Pre-requisites | Curiosity and wills to go out of an engineer comfort area. |

COURSE OUTLINE:

- Brief history of design and business evolution
- Design thinking
- Methods of ethnology / sociology to be user centric
- New business thinking
- Practical focus to the new IoT paradigm

COURSE 2

COURSE OVERVIEW:

Intermediate software course that provides students with knowledge of the using Solidwoks software to modeling a 3D object. 3D printing is one of the tools that made rapid prototyping of a connected object possible. This hands-on course aims to take ownership of the SolidWorks 3D CAD software. The student will then be able to apprehend the machines of a FabLab to go to the physical object.

| Course Title | Design 3D object |
|-------------------|--|
| Learning outcomes | Be able to modeling a 3D object with Solidworks software |
| Pre-requisites | - |

COURSE OUTLINE:

- Using the Interface and the basic Features
- Assembly Basics
- SolidWorks Toolbox Basics
- Basic Drawing Functions SolidWorks and eDrawings Basics
- Rotation and Sweep Features
- Smoothing Functions
- SolidWorks SimulationXpress

COURSE 3

COURSE OVERVIEW:

The aim of this course is for students to learn about rapid prototyping methods and to learn how to use a 3D printer and a laser.

Interactive pedagogy adapted to the type of skills targeted is the approach chosen for this course, while facilitating teamwork through project-based learning.

The first step will be devoted to the presentation of the existing 3D printing technologies, as well as to the printers available to the laboratory (FabLab). We approach the basic rules for preparing and printing a 3D modeled object as well as a explanation of the operation of the laser available in the FabLab.

Then, each team will launch the impression of the modeled object. The second part of the session will be devoted to working with the laser and presenting the basic rules for cutting a part

| Course Title | Prototyping 3D object in a Fablab |
|-------------------|---|
| Learning outcomes | How to create the 3D object within a fablab |
| Pre-requisites | Basic knowledge of 3D modeling, knowledge that they will have to use for modeling and then the printing of a 3D part (Course 2) |

COURSE OUTLINE:

- Model a piece that does not exceed the dimensions of a 30mm cube.
- Basic rules for preparing and printing a 3D modeled object
- Model a part that can then be laser-worked and can be integrated into the 3D printed part
- Make your own project

OPERATING SYSTEMS

Certificate awarded by: ECE Paris

Welcome event: July 2nd, 2018 (morning) **Start date of courses:** July 2nd, 2018 (afternoon)

End date: July 26th, 2018 **Certificate Ceremony:** July 26th, 2018

Total ECTS: 8 **Total contact hours:** 78

Program requirement: a minimum 18 years of age

Program location: ECE Paris - 37 quai de Grenelle, 75015 Paris, France

Language of instruction: English

PROGRAM FEE: 1,850€

FEE INCLUDES:

- Orientation/Welcome Event
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- Computer accounts at the school (WIFI access)
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COURSES

| Course Title | ECTS (credits) | Contact hours | Level (undergraduate or graduate) |
|-------------------------|----------------|---------------|---|
| Advanced Programming | 4 | 39 | undergraduate |
| Operating Systems | 4 | 39 | undergraduate |

CONTACT

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PROGRAM COURSE DESCRIPTIONS

COURSE 1

COURSE OVERVIEW:

This is an intermediate level computer science course in which programming concepts and techniques will be studied in order to construct computer applications, which have an interface to the operating system. This class requires previous knowledge in programming, TOS structures, and operating systems. The learning outcome for this course is for students to develop programs in which the concepts of concurrent and multi-core programming are put into practice.

Upon completion of this course, students will have acquired an advanced knowledge of the development of programs in

C, their debugging and implementation for the design and development of computer applications that optimize the utilization of the operating system nucleus resources; fully understand operating system process management and the synchronization and communication techniques between the processes, as well as the advantages of developing concurrent and multithreaded algorithms simultaneously in order to implement them using tools that guarantee their efficiency.

| Course Title | Advanced Programming |
|-------------------|---|
| Learning outcomes | Learn how to use the different function/system calls in order to : <ol style="list-style-type: none">1. manage processes2. manage the memory3. manage files4. manage I/O |
| Pre-requisites | C programming |

COURSE OUTLINE:

- User's View
 - linux commands
 - scripting
- Programmer's View
 - Creating processes and running applications
 - Implement « system » and program a simple shell (managing files)
 - Implement « ls » (file meta-information)
 - Parallelizing calculations using processes and shared memory
 - I/O management – using sockets to create a client and a server (distant calculator with multiple clients, chat application)
 - I/O management – implementing redirections
 - I/O management – using unnamed and named pipes

COURSE 2

COURSE OVERVIEW:

Intermediate computer course that provides students with knowledge of the functioning and interaction of the components of operating systems. Students will use a programming language that is compatible with open-source OS in order to apply the basic concepts of operating systems. This will allow students to understand an open-source operating system and give them the bases for managing and evaluating operating systems, as well as the opportunity to apply the operating-system concepts and techniques in other environments. Students will complete programming exercises related to these topics. This course requires prior knowledge

of programming and data structures. Learning outcome: students will solve problems related to the basic algorithms used in diverse components of an operating system. They will demonstrate their competent handling of commands, system calls and device management for specific Unix-type operating systems in the laboratory. Programming using calls to systems such as fork, system and basic concurrent programming for managing processes and threads (POSIX). Development of programs to add functionality to the Operative System nucleus applying the concepts learned in the classroom.

| Course Title | Operating Systems |
|-------------------|---|
| Learning outcomes | Understand how the operating system manages its resources (processor, memory, Filesystems, I/O) |
| Pre-requisites | C programming |

COURSE OUTLINE:

- Process Management
- Threads vs Processes
- Synchronization (Theory and Practice)
- Memory Management
- Paging implementation
- Filesystems (FAT, Inode, ...)
- I/O Management

WEB APPLICATION DEVELOPMENT

Certificate awarded by: ECE Paris

Welcome event: July 2nd, 2018 (morning) **Start date of courses:** July 2nd, 2018 (afternoon)

End date: July 26th, 2018 **Certificate Ceremony:** July 26th, 2018

Total ECTS: 8 **Total contact hours:** 72

Program requirement: a minimum 18 years of age

Program location: ECE Paris - 37 quai de Grenelle, 75015 Paris, France

Language of instruction: English

PROGRAM FEE: 1,850€

PROGRAM OVERVIEW/OBJECTIVE:

The purpose of this intermediate-level computing course is for students to understand aspects of and necessary techniques for developing client/server applications at the web level. Requires previous knowledge of operating systems and basic network concepts. The learning outcome of this course is for students to understand the most relevant technologies for development of web applications. Students implement simple web applications that use technologies applicable to industry. They select the best technological option for solving problems that require interaction with a web server.

Upon completion of this course, students will be able to evaluate, design and develop web applications using the industry's current protocols, models and architectures.

KEY WORDS:

HTML5, PHP, CSS, CSS3, JAVASCRIPT, JQUERY, MYSQL, dynamic web site, commercial web site, web applications

COURSES

| Course Title | ECTS (credits) | Contact hours | Level (undergraduate or graduate) |
|------------------|----------------|---------------|--|
| Learn HTML-CSS | 1 | 6 | Beginner, undergraduate or graduate students and researchers |
| Learn PHP | 6 | 60 | Beginner, undergraduate or graduate students and researchers |
| Learn JavaScript | 1 | 6 | Beginner, undergraduate or graduate students and researchers |

CONTACT

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PROGRAM COURSE DESCRIPTIONS

COURSE 1

| Course Title | Learn HTML-CSS |
|----------------------|---|
| Learning outcomes | <p>Upon successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none">- Edit, modify, or transform existing HTML documents and CSS style sheets to produce specified outputs.- Correct syntax errors in HTML documents and CSS style sheets.- Simplify unnecessarily complex HTML or CSS code.- Write syntactically and stylistically correct HTML documents and CSS style sheets.- Recognize and identify Server Side Includes, JavaScript, and PHP in existing HTML documents.- Correctly define and use fundamental terms and concepts related to web development. |
| Pre-requisites | Students should have basic knowledge of computer and database |
| Recommended readings | Robin Nixon Learning PHP, MySQL, JavaScript, CSS & HTML5 3 rd Edition By (O'Reilly 2014, ISBN 978-1491949467) |

COURSE OUTLINE:

- Introduction of HTML versions;
- Different components of an HTML document: Title, sections, links, tables, forms ..., comments, and document model (DOM).
- HTTP protocol, HTML interpretation by the navigation tool; Navigation tool versus HTML technologies;
- HTML5 Introduction; New HTML tags;
- When to use HTML5? Different components: tags, forms, audio, video, API, etc,
- HTML5 development tools, CSS3 selectors, box-sizing, transformations

COURSE 2

| Course Title | Learn PHP |
|----------------------|--|
| Learning outcomes | <ul style="list-style-type: none">- Compose an html page that demonstrates the embedding of PHP program code.- Demonstrate the use a loop building strategy to properly code and apply iteration.- Demonstrate the use of appropriate selection statements- Use step-wise refinement to manage and solve programming problems.- Construct proper PHP code to connect, access, and update a MySQL database. |
| Pre-requisites | Learn HTML-CSS course or equivalent skills in computer and database |
| Recommended readings | Robin Nixon Learning PHP, MySQL, JavaScript, CSS & HTML5 3 rd Edition By (O'Reilly 2014, ISBN 978-1491949467) |

COURSE OUTLINE:

- PHP Introduction
- Variables
- Operators
- Control structures
- Loops
- Functions
- Libraries
- Forms : POST
- URL variables : GET, tests, controls, redirection
- Cookies
- Sessions
- Database
- MySQL database query in PHP : SELECT
- MySQL database query in PHP: Insert, Update, Delete
- Model-view-controller (MVC) patterns

COURSE 3

| Course Title | Learn JAVASCRIPT |
|----------------------|--|
| Learning outcomes | The student masters basic HTML, CSS and Javascript programming. The student is able to design and implement web pages that have consistent functionalities, and validate. The student is able to apply JQuery libraries and different media on web pages. The student writes fluent Javascript code. The student is able to design and build client-side cross-platform applications using latest HTML and other open technologies that support multimedia content. The student can write clean and well-commented code, and is able to include APIs for device resources. The student is able to create a site that has a consistent outlook. |
| Pre-requisites | Learn HTML-CSS course and Learn PHP course or equivalent skills in computer and database |
| Recommended readings | Robin Nixon Learning PHP, MySQL, JavaScript, CSS & HTML5 3 rd Edition By (O'Reilly 2014, ISBN 978-1491949467) |

COURSE OUTLINE:

- Learning basic Javascript concept
- Events handling
- Javascript events handling : keyboard handling, mouse, form-based events, Rollover
- Dynamics menu
- URL management (HTTP redirection)
- HTML-based forms handling
- Form validation functions
- Cascading Style Sheets