Subject name : Advanced Hardware Design	Code : EC-EII09-AHD
Number of hours per student : 12 H	ECTS Number : 1
Reference Teacher: Mickaël DARDAILLON	

Generalities

Objectives *(2000 characters)*

- Advanced hardware design method for complex digital systems
- Study and implementation of a complete design flow, from high-level description to hardware implementation

Targeted main competences are:
- Efficient use of available ressources pour design a numeric system
- Use of an high-level synthesis tool

Description *(2000 characters)*

- C language for high-level synthesis, design and optimisation
- Test and validation: verification methodology, automatic verification, testbed implementation
- Design, synthesis and verification of a system using Vivado HLS

Requirements *(2000 characters)*

- Programmable Logic
- C Language

Course requirements and assessments

Teaching Language *(2000 characters)*

hand-out in English and course taught in English

Teaching methods *(500 characters)*

Number of hours per course type: *(2000 characters)*

CM : 4 H
TD :
TP :
PR : 8 H

Evaluation *(200 characters)*

- Attendance at lectures and lab sessions
- Lab report

Bibliography

Bibliography *(2000 characters)*

R. Kastner, J. Matai, and S. Neuendorffer, Parallel Programming for FPGAs. 2018.
http://kastner.ucsd.edu/hlsbook

Contacts

Contacts *(2000 characters)*

Mickaël DARDAILLON

Other information

Other information

Target audience : 5EII

Subject name : Conferences	Code : EC-EII09-CONF
Number of hours per student : 16 H	ECTS Number : 1
Reference Teacher: Karol DESNOS	

Generalities

Objectives *(2000 characters)*

This module aims to provide an in-depth overview of the latest technological advancements in the field of electronic and digital embedded systems design. Through lectures by academic and industrial experts, students will be able to:

- Gain theoretical and practical knowledge of emerging technologies in industrial electronics and computing, particularly in industrial vision and image processing.
- Benefit from real-world industrial insights, helping them better understand the technical and economic challenges of deployed solutions.
- Familiarize themselves with future trends, such as the integration of artificial intelligence, industrial IoT, cyber-physical systems, or hardware security.

This module thus strengthens students' skills by exposing them to diverse expertise while preparing them for tomorrow's technological challenges.

Description *(2000 characters)*

8 conferences of 2h each throughout the semester.

Requirements *(2000 characters)*

Course requirements and assessments

Teaching Language *(2000 characters)*

Teaching methods *(500 characters)*

Conferences

Number of hours per course type: *(2000 characters)*

CM :
TD :
TP :
PR :
CONF : 16 H

Evaluation *(200 characters)*

PASS if every session is attended, FAIL otherwise.

Bibliography

Bibliography *(2000 characters)*

Contacts

Contacts *(2000 characters)*

Karol DESNOS

Other information

Other information

Target audience : 5EII

Subject name : Energy Consumption in Digital Systems	Code : EC-EII09-CONSO
Number of hours per student : 16 H	ECTS Number : 1
Reference Teacher: Olivier WEPPE	

Generalities

Objectives *(2000 characters)*

Energy consumption is a major challenge for electronic systems. For autonomous systems, managing energy consumption is essential to extend the autonomy or the system lifetime. Moreover, the significant increase of embedded electronic systems implies to reduce the energy optimization in order to limit the overall electricity consumption. The goal of this course is to manage and to optimize the energy consumption of embedded digital systems.

Description *(2000 characters)*

1- Introduction

2- Energy Consumption Modeling
- 2.1 Transistor models
- 2.2 Dynamic energy
- 2.3 Static energy

3- Power dissipation
- 3.1 Power and heat relationship
- 3.2 Power dissipation solutions

4- Energy consumption reduction
- 4.1 Dynamic energy reduction
- 4.2 Static energy reduction

5- Low power & energy System design
- 5.1 Power & energy estimation
- 5.2 Hardware design
- 5.3 Software design
- 5.4 Energy storage

Requirements *(2000 characters)*

EC-EII08-LP -Programmable Logic Devices
EC-EII08-SEE -Embedded Operating Systems
EC-EII07-ARC -Computer Architectures 2
EC-EII07-ELE - Electronics III

Course requirements and assessments

Teaching Language *(2000 characters)*

Teaching methods *(500 characters)*

- Lecture on theory of power efficiency
- Practical work are based on managing energy and power consumption on embedded multi-core platform with Linux OS. The targeted platform is a Multi-Core Linux Computer.

Number of hours per course type: *(2000 characters)*

CM : 8 H
TD :
TP : 8 H
PR :
CONF :

Evaluation *(200 characters)*

Practical work and project grading.

Bibliography

Bibliography *(2000 characters)*

Low-Power Electronics Design, C. Piguet, CRC Press, 2004

Contacts

Contacts *(2000 characters)*

Olivier WEPPE

Other information

Other information

Target audience : 5EII

Subject name : Video Compression and Transcoding	**Code : EC-EII09-COTR**
Number of hours per student : 39 H	**ECTS Number : 3**
Reference Teacher: Luce MORIN	

Generalities

Objectives *(2000 characters)*

This lecture aims at presenting fundamental and advanced methods dedicated to image and video compression. An overview of Audio/Video Standards and Codecs most commonly used in industry is presented.
Practical work is done using didactic softwares (ImageINSA, VCdemo), programming classical algorithms (in C and Matlab) and running classical codecs through opensource APIs allowing to analyse and transcode Audio/Video files (ffmpeg, dash).

Targeted skills are:
- To master image and video coding principles and methods
- To understand and build a coding scheme described as a block diagram
- To code state-of-the-art algorithms
- To master parameter setting of encoders
- To transcode a video

Description *(2000 characters)*

1. Transcoding of audio-visual contents : use-cases, codec, quality, containers
2. Basis of image coding: entropy coding (Huffman, CABAC), quantization, predictive coding (DPCM), transform coding
3. Still image standards: JPEG, JPEG 2000
4. Video compression principles : motion estimation, motion compensation
5. Standard video codecs: MPEG-2, MPEG-4, AVC, SVC, HEVC
6. Conferences by industrial partners ; conferences may vary each year ; examples :
   - Standardization, Felix Henry, Orange Labs
   - Neural based video coding, Théo Ladune, Orange Labs

Requirements *(2000 characters)*

Signal Processing (EC-EII06-TS, EC-EII07-TSAN).
Image Processing (EC-EII08-AI)
Mathematical optimization (EC-EII07-OM)

Course requirements and assessments

Teaching Language *(2000 characters)*

Handout in English

Teaching methods *(500 characters)*

- Revision of lecture notes. Preparation of practical works.
- Labs on transcoding with Visual Studio (C++, C#), ffmpeg, directshow, mediaInfo.
- Labs on compression with ImageINSA and VCDemo teaching softwares, libraries ffmpeg and dash, implementation of coding algorithms in C and Matlab.

Number of hours per course type: *(2000 characters)*

CM : 15 H
TD :
TP : 24 H
PR :
CONF :

Evaluation *(200 characters)*

Attendence,
Lab evaluation,
Written examination.

Bibliography

Bibliography *(2000 characters)*

-http://www.fourcc.org
-http://support.microsoft.com/kb/294880
-http://mpeg.chiariglione.org/
-http://en.wikipedia.org/wiki/Comparison_of_container_formats
-T. Ebrahimi, C. Christopoulos, "JPEG 2000 The next generation still image coding system", EUSIPCO'00, 2000
-Gregory K. Wallace, "The JPEG Still Picture Compression Standard" , IEEE Transactions on Consumer Electronics, Vol.38, No. 1, Février 1992
-Bernd Girod, "Image and Video Compression", lecture notes, Standford University, 2005
-Ian E Richardson, "H.264 and MPEG-4 Video Compression", John Wiley ed., 2003
-Vector Quantization and Signal Compression, Allen Gersho, Robert M. Gray, Springer, 1992 - Computers

Contacts

Contacts *(2000 characters)*

Luce MORIN

Other information

Other information

Target audience : 5EII, Master SIVOS

Subject name : Design and Implementation of Signal Processing Systems	Code : EC-EII09-DISP
Number of hours per student : 24 H	ECTS Number : 2
Reference Teacher: Daniel MENARD	

Generalities

Objectives *(2000 characters)*

More and more embedded applications integrate Digital Signal Processing to deliver innovative features. The goal of this course is to master the implementation of digital signal processing applications on single-core fixed-point DSPs

Targeted main competences are:
- Develop C code for digital signal processing applications
- Optimize code for low power DSPs
- Optimize code for high performance DSPs
- Fixed-point conversion of digital signal processing systems

Description *(2000 characters)*

- Models for DSP applications
- Architecture of low power DSPs
- Architecture of high performance DSPs
- Fixed-point arithmetic
- Fixed-point conversion (dynamic range evaluation, fixed-point coding, numerical accuracy evaluation)

Requirements *(2000 characters)*

EC-EII07-ARC : Computer Architecture 2;
EC-EII07-TSAN : Signal processing and Digital automatic

Course requirements and assessments

Teaching Language *(2000 characters)*

Handout in English

Teaching methods *(500 characters)*

Pedagogy based on project..

Number of hours per course type: *(2000 characters)*

CM : 10 H
TD :
TP : 14 H
PR :
CONF :

Evaluation *(200 characters)*

Project report.

Bibliography

Bibliography *(2000 characters)*

[1] MADISETTI V., "VLSI Digital Signal Processors", IEEE Press, 1995;
[2] LAPSLEY P. & al., "DSP Processor Fundamentals", IEEE Press, 1995;
[3] BAUDOUIN G. & VIROLLEAU F., "DSP : les processeurs de traitement du signal", Dunod, 1996.

Contacts

Contacts *(2000 characters)*

Daniel MENARD

Other information

Other information

Target audience : 5EII

Subject name : Internship evaluation	Code : EC-EII09-EVST
Number of hours per student :	ECTS Number : 1
Reference Teacher: Jean-Gabriel COUSIN	

Generalities

Objectives *(2000 characters)*

This module assesses the fourth-year Electronics and Computer Engineering (EII) internship,
cf. EC-EII08-STAGE.

Description *(2000 characters)*

Requirements *(2000 characters)*

Course requirements and assessments

Teaching Language *(2000 characters)*

Cliquez ou appuyez ici pour entrer du texte.

Teaching methods *(500 characters)*

Number of hours per course type: *(2000 characters)*

Evaluation *(200 characters)*

Bibliography

Bibliography *(2000 characters)*

Contacts

Contacts *(2000 characters)*

Jean-Gabriel COUSIN

Other information

Other information

Subject name : Corporate Social Responsibility and Agile	**Code : EC-EII09-HUMT**
Number of hours per student : 20 H	**ECTS Number : 1**
Reference Teacher: Karol DESNOS	

Generalities

Objectives *(2000 characters)*

This module comprises two parts with distinct objectives:
- Corporate social responsibility: Raise awareness of CSR issues, present the main concepts and institutional framework based on concrete case studies.
- Agile methods: Introduction to the use of agile methods for project management.

Description *(2000 characters)*

Corporate social responsibility content (12 hours):
1. Definition of CSR - Methods for implementing CSR and social reporting in companies
2. Environmental performance
3. Social performance

Agile methods content (8 hours):
1. Presentation of agile method concepts
2. Practical assignment on a fake example.

Requirements *(2000 characters)*

None

Course requirements and assessments

Teaching Language *(2000 characters)*

French

Teaching methods *(500 characters)*

CSR: Working in teams of 3-4, students analyze the CSR policy of a company of their choice.

Number of hours per course type: *(2000 characters)*

CM :
TD : 20 H
TP :
PR :
CONF :

Evaluation *(200 characters)*

Bibliography

Bibliography *(2000 characters)*

Contacts

Contacts *(2000 characters)*

Karol DESNOS

Other information

Other information

Target audience : 5EII

Subject name : Hardware Security	Code : EC-EII09-HWS
Number of hours per student : 18 H	ECTS Number : 1
Reference Teacher : Maxime PELCAT	

Generalities

Objectives *(2000 characters)*

This course aims at providing a broad view on the challenges of hardware security in digital systems, and to make students learn by experimenting on security breaches that are resistant to software-based solutions.

Description *(2000 characters)*

The course gives first an overview on the digital hardware security challenges in their three dimensions: confidentiality, integrity, and availability of system assets: code, data, cryptographic key, and peripherals. The main types of attacks are explained, as well as main countermeasures, based e.g. on cryptography and protocols for confidentiality and integrity threats. Network-based attacks, intrusions detection methods and countermeasures are introduced, as well as malwares.

A focus is then put on attacks that cannot be solved through pure software solutions: "hardware attacks". Three types of attacks are detailed: attacks on the software stack mitigated through architectural features, attacks on hardware architecture itself, and physical attacks on digital processing through covert and side channels.

Practical work experiment accessing the secrets of a microcontroller-based system through different forms of attacks.

Requirements *(2000 characters)*

* EC-EII05-SIG2 - Signaux et systèmes II
* EC-EII06-TS - Traitement du signal
* EC-EII05-ARC - Architecture des calculateurs
* EC-EII06-SMC - Systèmes à microcontroleurs
* EC-EII06-PS - Programmation Système

Course requirements and assessments

Teaching Language *(2000 characters)*

Course material in english, practical session material in french

Teaching methods *(500 characters)*

Three courses of 1h30 and 6 practical sessions of 2 hours each, on passive and active attacks. Practical sessions are using a Jupyter Notebook and the Python language.

Number of hours per course type: *(2000 characters)*

CM : 6 H
TD :
TP : 12 H
PR :
CONF :

Evaluation *(200 characters)*

The course is graded on results to practical session exercises.

Bibliography

Bibliography *(2000 characters)*

* Colin O'Flynn and Jasper van Woudenberg. Breaking Embedded Security with Hardware Attacks. No Starch Press, 2022
* Swarup Bhunia, and Mark Tehranipoor. Hardware security: a hands-on learning approach. Morgan Kaufmann, 2018.

Contacts

Contacts *(2000 characters)*

Alla Eddine Bahi
Maxime Pelcat

Other information

Other information

Target audience : Master 2 students, electrical engineering

Subject name : Machine Learning for image Processing	Code : EC-EII09-MLIP
Number of hours per student : 20 H	ECTS Number : 2
Reference Teacher : Lu ZHANG	

Generalities

Objectives *(2000 characters)*

This module focuses on providing basic Machine Learning methods to apply to detection and classification problems in the field of image processing.
The targeted skills are:
-> Know the principles and basics of Machine Learning methods
-> Conduct a detection or classification project using a method introduced in the module.

Description *(2000 characters)*

1- Detection and classification
2- Supervised Learning
3- Non-supervised Learning
4- Neural Networks

Requirements *(2000 characters)*

Mathematics (EC-ESM05-ANAL, EC-EII05-PROBA), Signal processing and Digital automatic (EC-EII07-TSAN)

Course requirements and assessments

Teaching Language *(2000 characters)*

English

Teaching methods *(500 characters)*

Lectures and practical works.

Number of hours per course type: *(2000 characters)*

CM : 8 H
TD :
TP : 12 H
PR :
CONF :

Evaluation *(200 characters)*

Project.

Bibliography

Bibliography *(2000 characters)*

[1] Bangjun Lei, Guangzhu Xu, Ming Feng, Yaobin Zou, Ferdinand Van Der Heijden, Dick De Ridder and David M.J.Tax, "Classification, parameter estimation and state estimation : an engineering approach using MatLab", Second Edition, Wiley, 2017. [2] R.O. Duda, P.E. Hart and D.G. Stork, "Pattern Classification", John Wiley & Sons, Ltd, London, UK, 2001. [3] S.M. Kay, "Fundamentals of Statistical Signal Processing- Estimation Theory", Prentice Hall, New Jersey, 1994.

Contacts

Contacts *(2000 characters)*

Lu ZHANG

Other information

Other information

Target audience : 5EII

Subject name : Parallel Programming for Embedded MPSoCs	Code : EC-EII09-PPEM
Number of hours per student : 30 H	ECTS Number : 2.50
Reference Teacher : Karol DESNOS	

Generalities

Objectives *(2000 characters)*

For many years, following the ever-increasing number of transistors per chip, advances in computer architecture mostly consisted of adding complex mechanisms to mono-core processors to improve their computing performance. In the last decade, the continuous growth of computing performance was supported by the introduction of multi-core architectures, first for high-performance computing, then in mainstream desktop CPUs, and now in smartphones and embedded systems.

Embedded systems implementing modern applications such as telecommunication standard 3GPP Long Term Evolution (LTE) and video compression standard MPEG High Efficiency Video Coding (HEVC) require high execution speed, low power consumption and run-time adaptivity.

Adaptivity, memory limitation and load balancing between cores are hard to obtain. This course intends to give an overview of distributed high performance solutions and of the new challenges brought by latest applications and Multiprocessors Systems-on-Chips (MPSoCs) architectures such as the 8-core Texas Instruments TMS320C6678 or the 256-core Kalray MPPA. Solutions for programming such architectures will be discussed.

Targeted competences are:
- To understand internal mechanisms of multicore MPSoCs
- To program multi-core architectures using pthread, OpenMP, and Preesm
- To choose a multicore programming method while understanding its limitations
- To design a high performance embedded systems using available resources efficient

Description *(2000 characters)*

- Models of Computation
- Multicore Architectures
- Architecture Models
- Assignment and Ordering Problem
- Multicore Programming Tools

Requirements *(2000 characters)*

Computer Architecture I & II (EC-EII05-ARC, EII07-ARC), C Language (EC-EII05-PROGC).

Course requirements and assessments

Teaching Language *(2000 characters)*

hand-out in English and course taught in English

Teaching methods *(500 characters)*

- Courses given by internal and external professors
- Practical work and project are based on pthread, OpenMP, and the dataflow-based programming.
- Target architectures are multicore x86 processors and the TMS320C6678 multi-DSP evaluation board
- The goal of practical work is for students to acquire competences for programming the platform
- The project aims at giving students some programming habits Courses with internal and external teachers

Number of hours per course type: *(2000 characters)*

CM : 8 H
TD :
TP : 12 H
PR : 10 H
CONF :

Evaluation *(200 characters)*

Quiz 1h (coef. 1/3)
Project work (coef. 2/3)
Lab report (optional, used as a retake if needed)

Bibliography

Bibliography *(2000 characters)*

J Karam, I. AlKamal, A. Gatherer, G. A Frantz, D. V Anderson, and B. L Evans, "Trends in multicore DSP platforms, IEEE SPM, 2009
Hae-woo Park, Hyunok Oh, and Soonhoi Ha, "Multiprocessor SoC Design Methods and Tools", IEEE SPM, 2009
S. Sriram, S. S. Bhattacharyya, "Embedded Multiprocessors : Scheduling and Synchronization - Second Edition", CRC Press, 2009
M. Pelcat, S. Aridhi, J. Piat, J-F. Nezan, "Physical Layer Multicore Prototyping: A Dataflow-Based Approach for LTE eNodeB", Springer, 2012

Contacts

Contacts *(2000 characters)*

Karol DESNOS

Other information

Other information

Target audience : 5EII

Subject name : Innovative Technologies Project	Code : EC-EII09-PROJ
Number of hours per student : 60 H	ECTS Number : 5.50
Reference Teacher : Xiaoran JIANG	

Generalities

Objectives *(2000 characters)*

Targeted main competences are:
- To manage a project within a team on a technical topic proposed by an industrial partner
- To collaborate with an industrial partner and take into account industrial requirements and organization
- To apply technical and management skills acquired during academic lectures
- To practice report writing and oral presentation on technical topics

Description *(2000 characters)*

- First meeting with industrial partner to write together project functional specifications
- Task scheduling and task repartition
- State of the art and bibliographic research (if necessary)
- Experimental development and validation
- Regular meetings with project advisors (academic/industrial)
- Report writing, presentation slides
- Oral defense of the project

Examples of project topics:
- Visual closed-loop control of a UAV (Unmanned Aerial Vehicle)
- Optimization of an audio resampling rate library
- Development of an oriented-object library for audio fixed-point processing
- Multi-energy heating management
- Physiologic parameters measurement from video sensor
- CPL transmission of video stream on a specific electronic card

Requirements *(2000 characters)*

Course requirements and assessments

Teaching Language *(2000 characters)*

Teaching methods *(500 characters)*

Number of hours per course type: *(2000 characters)*

CM :
TD :
TP :
PR :
CONF :
Autres :

Evaluation *(200 characters)*

- Quality of work done
- Written report
- Oral presentation

N.B.: The jury is composed of professors and industrial partners.

Bibliography

Bibliography *(2000 characters)*

Contacts

Contacts *(2000 characters)*

Xiaoran JIANG

Other information

Other information

Target audience : 5EII

Subject name : Software Quality	Code : EC-EII09-SWQ
Number of hours per student : 26 H	ECTS Number : 2.50
Reference Teacher : Nicolas BEUVE	

Generalities

Objectives *(2000 characters)*

This module aims to provide students with the tools, methods, and essential practices needed to produce reliable, maintainable, testable, and secure software.
By the end of the course, students will be able to:

- **Master modern software quality concepts** through the use of the Rust programming language.
- **Apply advanced source code management practices** with Git, including collaboration, code review, and conflict resolution.
- **Build and use reproducible environments** with Docker, especially for testing on different architectures via QEMU.
- **Set up continuous integration (CI) pipelines** on GitHub to automate tests and detect regressions.
- **Develop a rigorous testing approach**, including unit tests, integration tests, test automation, and good development practices.

Description *(2000 characters)*

1. **Modern programming language (Rust) and software quality**
   - 4h lecture
   - Self-study preparation for lectures
   - 4h practical work
2. **Advanced Git**
   - 2h lecture
   - 2h practical work
3. **Docker / QEMU**
   - 2h lecture
   - 4h lab
4. **Continuous Integration (GitHub Actions)**
   - 2h lecture
   - 2h practical work
5. **Project** (4h)

Requirements *(2000 characters)*

Object Oriented Programming (EC-EII07-POO) & C Programming (EC-EII05-PROGC).

Course requirements and assessments

Teaching Language *(2000 characters)*

Cliquez ou appuyez ici pour entrer du texte.

Teaching methods *(500 characters)*

Revision of lecture notes. Preparation of exercises.

Number of hours per course type: *(2000 characters)*

CM : 10 H
TD : 12 H
TP :
PR : 4 H
CONF :
Autres :

Evaluation *(200 characters)*

4hour in-class project. This work includes the implementation of unit and integration tests, the construction of Docker images for different architectures (via QEMU), as well as the setup of a continuous integration pipeline using GitHub Actions to automate all tests and checks. Students must also apply advanced code management practices with Git, including the use of branches, pull requests, and code review.
.

Bibliography

Bibliography *(2000 characters)*

1. *Steve Klabnik, Carol Nichols, and Chris Krycho*, "The Rust programming language", 2025.

Contacts

Contacts *(2000 characters)*

Nicolas BEUVE

Other information

Other information

Target audience : 5EII

Subject name : High-Level SystemC Language	Code : EC-EII09-SYSC
Number of hours per student : 14 H	ECTS Number : 1.00
Reference Teacher : Jean-Christophe PREVOTET	

Generalities

Objectives *(2000 characters)*

This lecture aims at presenting the System Design languages (SystemC) for complex system designing. Special emphasis will be given on modelling across different levels of abstraction from untimed via timed transaction level models down to register transfer models including the needed refinement steps.

Description *(2000 characters)*

1. Requirements for a system methodology in order to design a system. Overview of existing methodologies
2. Presentation of the System C language syntax. :
- Programming environment.
- Concepts of module, port, channel, interface. Channels, ports, interfaces, Module constructor Events, Event queue, Thread processes, Method processes Module instantiation (in modules)
3. Simulation of complex systems with System C.
4. Labs on a transmission system. Simulation of the system and implementation on an embedded SOC.

Requirements *(2000 characters)*

Course requirements and assessments

Teaching Language *(2000 characters)*

course taught in English

Teaching methods *(500 characters)*

Cliquez ou appuyez ici pour entrer du texte.

Number of hours per course type: *(2000 characters)*

CM : 8 H
TD :
TP : 6 H
PR :
CONF :
Autres :

Evaluation *(200 characters)*

1 hour exam

Bibliography

Bibliography *(2000 characters)*

Contacts

Contacts *(2000 characters)*

Jean-Christophe PREVOTET

Other information

Other information

Target audience : 5EII

Subject name : 3D computer Vision	Code : EC-EII09-VIS
Number of hours per student : 26 H	ECTS Number : 2.00
Reference Teacher : Luce MORIN	

Generalities

Objectives *(2000 characters)*

This course is an introduction to computer vision techniques with a single camera or with several ones. Estimation processes used in computer vision are also studied.
The targeted skills are :
- Solve a pose computation problem by using a Gauss-Newton minimization,
- Compute and display the epipolar geometry properties of a stereo pair of images,
- Estimate a 2D tranformation using a RANSAC algorithm.

Description *(2000 characters)*

1. Monocular vision geometry (perspective projection, calibration and pose estimation)
2. Sterevision : 3D reconstruction, epipolar geometry, 2D homography, autocalibration Pratical exercises are in C++ language.
Exercises and labs target the assimilation of the course concepts and methods.
During the labs, computer vision algorithms are implemented in C++ with the ViSP library.

Requirements *(2000 characters)*

Optimization (EC-EII08-OM)
Object oriented programming (EC-EII07-POO)

Course requirements and assessments

Teaching Language *(2000 characters)*

Handout in English

Teaching methods *(500 characters)*

Revision of lecture notes. Preparation of labs.

Number of hours per course type: *(2000 characters)*

CM : 12 H
TD : 2 H
TP : 12 H
PR :
CONF :
Autres :

Evaluation *(200 characters)*

Two-hour written examination (no documents) at the end of the semester.

Bibliography

Bibliography *(2000 characters)*

1. HORAUD R., MONGA O., "Vision par ordinateur", Hermès, 1993.
2. AYACHE N., "Vision stéréoscopique et perception multi-sensorielle", Inter-Ed. Science Info, 1988.
3. HARTLEY R., ZISSERMAN A., "Multiple View Geometry in Computer Vision", Second Edition, Cambridge University Press, March 2004

Contacts

Contacts *(2000 characters)*

Luce MORIN

Other information

Other information

Target audience : 5EII

Nom de la matière : Allemand	**Code EC: EC-HUMF09-ALL**
Volume horaire total par étudiant: 21heures	**Nombre crédits ECTS :**
	1,5 ECTS
Responsable(s) : Cecile Hölzner-Jacques	

Généralités

Objectives, aims *(2000 caracters)*

Targeted skills:
Mastering a foreign language
Ability to communicate/progress/work in an international and intercultural context
Cultural openness
Communicating/interacting with others, working in a team
Working autonomously
German Level A1: Acquiring the basics of the German language. Be able to understand and hold a simple conversation about everyday life.
German Level A2-B1: Be able to communicate in German, acquire intercultural skills, demonstrate cultural openness. Work in a group on a project, speak up.
German Level B2/C1: Work in a group on a project, speak up, communicate in German, acquire intercultural skills, acquire basic scientific and technical vocabulary. Ask questions, become a responsible engineer, think about the world of tomorrow in an international context.

Description *(2000 caracters)*

Practising written and oral comprehension. Developing oral expression through exercises in small groups and whole-class discussions. Acquire everyday German vocabulary for daily life and professional life.
German Level A2-B1: Grammar revision, consolidate knowledge. Practise reading and listening comprehension using multimedia resources. Develop oral expression skills through small group exercises, presentations or whole class discussions. Prepare students to progress independently in languages. Preparing mobility.
German B2-C1: Practise reading and listening comprehension using multimedia resources. Acquire technical and scientific German vocabulary. Develop oral expression skills through small group exercises, presentations or whole class discussions. Use and improve German language skills in the context of a project. Preparing mobility.

Pré-requis *(2000 caractères)*

German Level A1: none

German Level A2-B1: mastery of the basics of German (A2), second foreign language at secondary school (B1)

German B2-C1: good language skills, first foreign language or bilingual class at secondary school, ABIBAC

Modalités du cours et des évaluations

Langue d'enseignement *(2000 caractères)*

Cliquez ou appuyez ici pour entrer du texte.

Modalités d'enseignement *(500 caractères)*

1.5–2 hours of classes per week.
IAutonomous study time: 14-16 hours Total: 35 hours. Students are encouraged to read German newspapers regularly and watch videos, series and films, in addition to the work assigned between sessions.

Volume horaire par type de cours : *(2000 caractères)*

CM :
TD : 19 hours for the first cycle, 21 hours for the second cycle.
TP :
PR :
CONF :
Autres :
Autonomous study time: 14-16 hours
7 hours of optional project work in the second cycle

Modalités d'évaluation / coefficient *(200 caractères)*

Continuous assessment, oral examination

Bibliographie

Bibliographie *(2000 caractères)*

MOODLE course page
Deutsch für Ingenieure, Maria Steinmetz/Heiner Dintera, VDI/Springer Vieweg, 2014
Deutsch Perfekt, periodical
online: Deutsche Welle, ARD, Der Spiegel, FAZ, die Zeit, das Handelsblatt, VDI (Verein Deutscher Ingenieure), Nachrichten, ZDF Logo
French-German dictionary le visuel, Editions de la Martinière
Übungsgrammatik für die Mittelstufe Hueber-Verlag
Na also! Waltraud Legros, Ellipses
multimedia resources

Contacts

Contacts *(2000 caractères)*

Cecile Hölzner-Jacques : cecile.holzner-jacques@insa-rennes.fr

Autres

Autres informations

Cliquez ou appuyez ici pour entrer du texte.

Subject name: ANGLAIS / TOEIC	Code EC: EC-HUM09-ANGL-TOEIC
Number of hours per student: 20 h	ECTS Number: 1.5
Reference Teacher: Philippe LE VOT	

Generalities

Objectives *(2000 characters)*

Improving communication skills in everyday life situations as well as in company and business context.
Obtaining or reinforcing the B2 level requested by the CTI.
Obtaining 800 score at the final TOEIC test.

Description *(2000 characters)*

Learning by doing : students will have to be able to speak and listen, write a document while showing they can solve problems, reason, convince and demonstrate in an articulate manner.
Expressing oneself accurately and fluently : students will engage in activities requiring creative and reactive skills such as debates, role-plays, individual oral Power Point presentations, projects, based on scientific topics and current events.

Requirements *(2000 characters)*

Not having already taken and passed the TOEIC test during the previous two years
B1/B2 level advised

Course requirements and assessments

Teaching Language *(2000 characters)*

Teaching methods *(500 characters)*

Each class lasts two hours and most classrooms are equipped with video and audio. A multimedia lab and computer rooms are also available for the students to work in a stimulating environment.

Teaching resources include press articles, audio and video documents (TV reports, extracts from films and series)as well as the Internet. B2 level tests are also taken throughout the course.

Number of hours per course type: *(2000 characters)*

CM:
TD: 20 heures
TP:
PR:
CONF:
Autres:

Evaluation *(200 characters)*

Final mark based on : TOEIC score at final exam + attendance (more than 4 non justified absences result in 0/20 mark).

Bibliography

Bibliography *(2000 characters)*

English grammar in Use, Intermediate Edition (CUP)
Robert and Collins bilingual dictionary or Collins Cobuild

Contacts

Contacts *(2000 characters)*

Other information

Other information

5th year students who haven't already passed their TOEIC

INSA RENNES : 2025/2026

Course Name: ENGLISH

Course Code: EC-HUM09-ANGL-CONV

Total Student Workload: 10 hours

ECTS Credits: 1.5

Instructor(s): Philippe Le Vot

General Information

This course is intended for 5th-year students who have already obtained their TOEIC certification (B2 level required by the CTI). At the start of the module, students choose between two options:

• ECIU Courses (European online university). These allow students to register for courses delivered by our European university partners and compare different approaches to engineering.

• Audio or video project/challenge (production of an individual or group final product), based on a common theme that changes every year.

Description

The courses offered on the ECIU European platform cover a very wide range of specialities and allow our students to participate in micro-challenges, take courses taught by a European network of partner universities, and compare perspectives on the engineering world.

Prerequisites

• A strong command of the 3rd- and 4th-year English curriculum is required.

Teaching and Assessment Methods

Language of Instruction: English

Teaching Method: Self-directed learning. Students choose a module and validate it with the European university offering the course. This is carried out under the supervision and in collaboration with the internal ECIU team at INSA Rennes.

Course Type and Hours:

Tutorials (TD): 10 hours

Assessment:

The final grade is the grade awarded by the institution responsible for the selected module.

Bibliography

Only reference:

https://www.eciu.eu/

Contacts

plevot@insa-rennes.fr

Ellea.Lhermite@insa-rennes.fr (ECIU support at INSA)

INSA RENNES : 2025/2026

Course Name: ENGLISH

Course Code: EC-HUM09-ANGL-CONV

Total Student Workload: 10 hours

ECTS Credits: 1.5

Instructor(s): Philippe Le Vot

General Information

This course is intended for 5th-year students who have already obtained their TOEIC certification (B2 level required by the CTI). At the start of the module, students choose between two options:

• ECIU Courses (European online university). These allow students to register for courses delivered by our European university partners and compare different approaches to engineering.

• Audio or video project/challenge (production of an individual or group final product), based on a common theme that changes every year.

Description

The courses offered on the ECIU European platform cover a very wide range of specialities and allow our students to participate in micro-challenges, take courses taught by a European network of partner universities, and compare perspectives on the engineering world.

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• A strong command of the 3rd- and 4th-year English curriculum is required.

Teaching and Assessment Methods

Language of Instruction: English

Teaching Method: Self-directed learning. Students choose a module and validate it with the European university offering the course. This is carried out under the supervision and in collaboration with the internal ECIU team at INSA Rennes.

Course Type and Hours:

Tutorials (TD): 10 hours

Assessment:

The final grade is the grade awarded by the institution responsible for the selected module.

Bibliography

Only reference:

https://www.eciu.eu/

Contacts

plevot@insa-rennes.fr

Ellea.Lhermite@insa-rennes.fr (ECIU support at INSA)

Subject name: CHINESE LV2-LV3	**Code EC: EC-HUMF09-CHI**
Number of hours per student: 21 hours	**ECTS Number: 1,5**
Reference Teacher: Cécile Hölzner-Jacques	

Generalities

Objectives *(2000 characters)*

Targeted skills:

- Mastering a foreign language
- Ability to communicate/develop/work in an international and intercultural context
- Cultural openness
- Communicating/interacting with others, working in a team
- Working independently
- Acquiring the basics of the Chinese language, essential structures and vocabulary
- Comprehension, expression, pronunciation
- Using the language in everyday contexts.

Description *(2000 characters)*

Oral skills:
Corrective phonetics (pinyin system),
Listening to and analysing simple texts and complex sentences,
Oral exercises (learners with each other / learners with teacher)
Learning new characters (pronunciation and tone accentuation).

Written skills:
Theme/version
Written production of simple texts and complex sentences,
Learning and reinforcement of grammatical mechanisms and vocabulary for oral and written production,
Learning new characters (stroke order, keys),
Reading and analysis of texts, commentary on texts.

Requirements *(2000 characters)*

Chinese 1: None
Chinese 2: Completion of Chinese 1
Chinese 3: Completion of Chinese 2

Course requirements and assessments

Teaching Language *(2000 characters)*

Teaching methods *(500 characters)*

Reading lesson texts (in characters), rewriting new characters, exercises applying grammar points, lexical and morphological points, theme and version exercises...

Number of hours per course type: *(2000 characters)*

CM:
TD: 1h30
TP:
PR:
CONF:
Autres:

Evaluation *(200 characters)*

S1: Final mark
S2: Oral examination

Bibliography

Bibliography *(2000 characters)*

1. Chinese as spoken in China, Bernard Allanic, Presses Universitaires de Rennes, 2009
2. Contemporary Chinese, WU Zhongwei, Sinolingua, 2010
3. Experiencing Chinese, ZHANG Rumei, AI Xin, Higher Education Press, 2006
Chinese Language Method (Second Level), Zhitang Yang-Drocourt - Liu Hong – Fan Jianmin
Short Stories for Learning Mandarin Chinese, Zhang Xiaoli, 2025
Standard Course HSK Workbook, Jiang Liping
Other tools will complement these basic textbooks to provide students with a wide range of practical exercises.

Contacts

Contacts *(2000 characters)*

Other information

Other information

Learning Chinese isn't just about tones and characters. It's about connection — to a culture, to people, and to the stories that make language come alive.

Subject name: French foreign language	**Code EC: EC-HUMF09-FLE**
Number of hours per student: 21 hours (or 2 x 21 hours for the Exchange programme)	**ECTS Number: 1,5**
	3 credits for the Exchange
Reference Teacher: FOURE Dominique	

Generalities

Objectives *(2000 characters)*

The various activities in the FLE and FOS (French for Specific Purposes) programme aim to develop optimal language proficiency and the use of language as a cultural and intercultural vehicle, a tool for work and communication adapted to the context. Students will develop their autonomy through group work and individual work.
Targeted skills/humanities (SHS): ▪ Knowing oneself, managing oneself physically and mentally▪ Working, learning and developing independently▪ Interacting with others, working in a team▪ Demonstrating creativity, innovation and initiative▪ Acting responsibly in a complex world▪ Developing in a professional and social environment▪ Working in an international and intercultural
context

Description *(2000 characters)*

Level A1/A2
1- Language, culture and communication: Help learners feel comfortable in all everyday situations. Language learning is organised around observing how the language works, practising a variety of activities in class and carrying out projects in real or simulated contexts to promote autonomy.

2- Scientific and academic French: Facilitate integration into scientific studies, student life and social life.

Level B1/B2
1- Language, culture and communication: Help learners express themselves fluently in writing and orally on a wide range of general and specialised topics.
Key themes: Studying and living in France/ Understanding and exercising critical thinking in various fields: current affairs/history/art/science and technology, urban planning, the environment, etc.
Social sciences and humanities: socio-ecological transition, business and innovation.

2- Preparation for DELFB2 or DALFC1, compulsory French language diploma required to obtain an engineering degree**.**

Level B2/C1
1- Interculturality - Study of European and international current affairs and in-depth exploration of issues related to SHS
- Communicate and interact
- Decode intercultural references in speech, attitudes and behaviour
- Put one's values, beliefs and behaviour into perspective
- Integrate cultural diversity into group work

2- Professional French
- Prepare effectively for finding an internship or job
- Understand complex issues within the company
- Master societal, political, economic, environmental, ethical and philosophical aspects, etc.
- Act responsibly in the professional world

Requirements *(2000 characters)*

None
Courses range from beginner to advanced levels.
Each student will be placed in a group corresponding to their level and needs
- based on a test at the beginning of the year for new entrants
- based on the level acquired and assessed the previous year for existing students

Course requirements and assessments

Teaching Language *(2000 characters)*

Learners are trained and assessed on the five skills recognised by the Common European Framework of Reference for Languages (CEFR).

Teaching methods *(500 characters)*

Language, communication and intercultural skills are tailored to the target level and the needs of the group (indicated in the group code).

Number of hours per course type: *(2000 characters)*

CM:
TD:
TP:
PR:
CONF:
Autres:

Evaluation *(200 characters)*

Continuous assessment in line with the skills to be validated: CE, CO, PE, PO
INSA student programme: 21 hours/semester (1.5 credits)
Exchange programme: Students studying for a semester at INSA Rennes have the opportunity to obtain a total of 4 credits
- 1 Language Project (7 hours/semester) = 1 ECTS
- 2 FLE courses (2X21 hours/semester) e.g. Language, Culture and Communication + Interculturality

Bibliography

Bibliography *(2000 characters)*

Materials selected by the teacher based on the level and objectives to be achieved

Contacts

Contacts *(2000 characters)*

Dominique.foure@insa-rennes.fr

Other information

Other information

https://fle.insa-rennes.fr/

Subject name: ITALIAN LV2-LV3	**Code EC: EC-HUMF09-ITA**
Number of hours per student: 21h	**ECTS Number: 1,5**
Reference Teacher: Cécile HÖLZNER-JACQUES	

Generalities

Objectives *(2000 characters)*

Targeted skills:
Mastering a foreign language
Ability to communicate/develop/work in an international and intercultural context
Cultural openness
Communicating/interacting with others, working in a team
Working independently

Level 1 beginner: Introducing Italian language and culture, expressing ideas in writing and orally.
Level 2 advanced beginner: By the end of the course, students should be able to converse and write in Italian.
Level 3 intermediate: Give students the opportunity to explore topics related to art, civilisation, literature and cinema in greater depth.

Description *(2000 characters)*

Oral expression and comprehension: reading the course material with phonetic and grammatical corrections with the teacher, reading the situations found in the text, watching films and reading literary texts and press articles.
Written expression and comprehension: doing the exercises in the text with particular attention to difficulties, summarising the situations without the text available and the films studied.

Requirements *(2000 characters)*

Beginner level: none.
Advanced beginner level A2: must have attended the beginner Italian course.
Intermediate level B1/advanced level B2: must have a good knowledge of the Italian language.

Course requirements and assessments

Teaching Language *(2000 characters)*

Italian language

Teaching methods *(500 characters)*

The course will cover:.
Grammar concepts;.
Exercises to understand basic linguistic mechanisms;.
Building vocabulary using keywords and translations;.
Presentations and discussions on given topics;.
Asking questions and knowing how to respond;.
Creating dialogues, stories, and discussions based on given keywords;
(All of this will be adapted to the average level of the course.)

1.5 hours of face-to-face lessons per week, 21 hours per semester.
Personal work: 14 hours Read the texts provided in the handouts; 7 hours create a dialogue or short story using the keywords provided and express yourself with them.

Number of hours per course type: *(2000 characters)*

CM:
TD: 21h
TP:
PR:
CONF:
Autres:

Evaluation *(200 characters)*

S1: Final mark
S2: Oral examination

Bibliography

Bibliography *(2000 characters)*

Loesher Archivio di Grammatica, https://italianoperstranieri.loescher.it/archivio-di-grammatica

Harraps, Italian Express Method, Vittoria Bowles and Paul Coggle

Texts taken from Italian novels, poems, essays, daily and weekly newspapers, and films by famous directors

Contacts

Contacts *(2000 characters)*

Paolo Procesi: Paolo.Procesi@insa-rennes.fr

Other information

Other information

Subject name: Japanese	**Code EC: EC-HUMF09-JAP**
Number of hours per student:	**ECTS Number: 1.5**
Reference Teacher: Cécile Hölzner-Jacques	

Generalities

Objectives *(2000 characters)*

Targeted skills:

Mastering a foreign language
Ability to communicate/develop/work in an international and intercultural context
Cultural openness
Communicating/interacting with others, working in a team
Working independently

Beginner level (A1):

-Awareness of specific features (phonetics, syntax)
-Discovering Japanese culture, traditions and customs
-Learning two writing systems (Hiragana and Katakana)
-Mastering spoken Japanese in everyday situations.

Intermediate level (A2):

- Introduction to ideograms (30-60 kanji)
- Reading simple texts (using manga, etc.)
- Writing simple texts
- Mastering spoken Japanese in everyday situations.

Advanced level (B1, B2):

- Learning kanji (60-200)
- Acquiring four skills (reading, listening, writing and speaking) for travelling and studying in Japan.

Description *(2000 characters)*

Description (2000 characters)
Level 1 beginner (A1):
- Improvement of Hiragana and Katakana
- Mastery of Japanese in everyday situations (Marugoto A1).
Lesson 3: Me_ Nice to meet you
Lesson 4: Me_ There are three of us in my family
Lesson 5: Food_ What kind of food do you like?
Lesson 6: Food_ Where shall we eat?
Lesson 7: The house_ It's a three-room flat
Lesson 8: The house_ What a beautiful room you have!

Lesson 9: Everyday life_ What time do you get up?
Lesson 10: Everyday life_ When are you available?
Level 2 Intermediate (A2):
- Continuation of the Marugoto textbook (Lessons 11 to 18)
- Learning new basic grammar points (past tense, potential tense, volitional tense, etc.)
- Improving and discovering new particles (で、に、から/まで, etc.)
- Discovering and learning 30-60 kanji
- Reading and writing simple texts
- Learning to communicate in everyday situations.

Intermediate level (B1, B2):

- Reading manga
- Acquiring four skills (reading and listening comprehension, writing and speaking).

Requirements *(2000 characters)*

Beginner level A1: none.
Beginner level A2: completion of beginner level A1.
Intermediate/advanced level: completion of beginner levels A1/A2.

Course requirements and assessments

Teaching Language *(2000 characters)*

Teaching methods *(500 characters)*

Teaching takes the form of tutorials. Each session consists of an explanation of concepts, which are then illustrated with examples and conversation exercises in which the students participate.

Number of hours per course type: *(2000 characters)*

CM:
TD:21h
TP:
PR:
CONF:
Autres:

Evaluation *(200 characters)*

A1
S1 and S2: Final mark

A2 and B1
S1: Final mark
S2: Oral examination

Bibliography

Bibliography *(2000 characters)*

Level 1 beginner (A1): Margoto A1, Japan Foundation, 2013, Japan.

Level 2 beginner (A2): Margoto A2, Japan Foundation, 2014, Japan.

Contacts

Contacts *(2000 characters)*

Other information

Other information

Subject name: Intercultural Modul	**Code EC: EC-HUMF09-LV2-OI**
Number of hours per student: 21h par semestre	**ECTS Number: 1.5**
Reference Teacher: Cécile Hölzner-Jacques	

Generalities

Objectives *(2000 characters)*

The course aims to develop students' fluency in both written and spoken communication while fostering philosophical reflection. It not only enhances reading, listening, and expressive skills but also cultivates critical thinking and confident public speaking. Particular emphasis is placed on rigorous reasoning, clear argumentation, and the ability to connect philosophical inquiry with linguistic precision.

Description *(2000 characters)*

Each semester is devoted to a specific philosophical concept. For the first semester of 2025, the theme is *violence*.
The course is divided into two distinct parts. The first part focuses on language development. Each session begins with a warm-up activity designed to encourage oral participation and group interaction. Students engage in creative writing exercises — such as recounting a memory or imagining a story — to stimulate imagination and improve expressive skills. Regular reading of newspaper articles helps strengthen reading comprehension, pronunciation, and vocabulary.
The second part of the course is dedicated to project work, which constitutes the final graded assignment. Through these projects, students synthesize language practice and philosophical reflection, applying both to a concrete and personally meaningful topic.

Requirements *(2000 characters)*

Students should be able to express themselves in English with a reasonable degree of confidence. Mistakes in grammar or pronunciation are not a problem, but a solid foundation in vocabulary and basic grammar is necessary to follow the course. The class usually includes both bilingual students and others with more limited proficiency, so the activities are designed to allow everyone to participate meaningfully and progress at their own pace.

Course requirements and assessments

Teaching Language *(2000 characters)*

The course is conducted primarily in English, although French may occasionally be used for clarification or discussion when necessary.

Teaching methods *(500 characters)*

This is not a traditional lecture-based course but an interactive class built around students 'interests. It is designed as a space for expression and reflection. Written and video materials are regularly used, and students are encouraged to take an active role through role-playing activities and short theatrical performances.

Number of hours per course type: *(2000 characters)*

CM:
TD: 20 h par semestre
TP:
PR:
CONF:
Autres:

Evaluation *(200 characters)*

Assessment is based on attendance and participation, but mainly on a creative end-of-term project demonstrating linguistic skills and critical thinking, completed individually or in groups

Bibliography

Bibliography *(2000 characters)*

Books

Camus, Albert. *The Stranger*. Translated by Stuart Gilbert. New York: Vintage Books, 1942.
Dostoevsky, Fyodor. *Crime and Punishment*. Translated by Constance Garnett. New York: Modern Library, 1866.
Flock, Elizabeth. *The Furies: Women, Vengeance, and Justice*. New York: Harper, 2024.
Malm, Andreas. *How to Blow Up a Pipeline: Learning to Fight in a World on Fire*. London: Verso Books, 2021.
Manne, Kate. *Down Girl: The Logic of Misogyny*. Oxford: Oxford University Press, 2017.
Motz, Anna. *If Love Could Kill: The Myths and Truths of the Women Who Commit Violence*. New York: Knopf, 2024.
Thoreau, Henry David. *Civil Disobedience*. Boston: David R. Godine, 1849.
Zinn, Howard. *A People's History of the United States*. New York: Harper & Row, 1980.

Articles and Essays

King, Martin Luther, Jr. "Letter from Birmingham Jail." April 16, 1963.
Schwartz, Alexandra. "When Women Commit Violence." *The New Yorker*, 2024.
Zinn, Howard. "The Problem is Civil Obedience." Speech delivered at Johns Hopkins University, Baltimore, November 1970.

Films and Television

Bong Joon-ho, dir. *Parasite*. Seoul: Barunson E&A, 2019.
Coen, Joel, and Ethan Coen, dirs. *Fargo*. Los Angeles: PolyGram Filmed Entertainment, 1996.
Coen, Joel, and Ethan Coen, dirs. *No Country for Old Men*. Los Angeles: Miramax Films, 2007.
Demme, Jonathan, dir. *The Silence of the Lambs*. Los Angeles: Orion Pictures, 1991.
Fincher, David, dir. *Gone Girl*. Los Angeles: 20th Century Fox, 2014.
Fincher, David, dir. *The Girl with the Dragon Tattoo*. Culver City: Columbia Pictures, 2011.
Fincher, David, dir. *Zodiac*. Los Angeles: Paramount Pictures, 2007.
Gilligan, Vince, creator. *Breaking Bad*. Los Angeles: AMC, 2008–2013.
Kelly, Richard, dir. *Donnie Darko*. Los Angeles: Newmarket Films, 2001.
Lanthimos, Yorgos, dir. *The Killing of a Sacred Deer*. London: A24, 2017.
Lynch, David, and Mark Frost, creators. *Twin Peaks*. Los Angeles: CBS Television Distribution, 1990–1991, 2017.
Martin, Steve, and John Hoffman, creators. *Only Murders in the Building*. Los Angeles: Hulu, 2021–.
Miller, George, dir. *Furiosa: A Mad Max Saga*. Burbank: Warner Bros., 2024.
Miller, George, dir. *Mad Max: Fury Road*. Burbank: Warner Bros., 2015.
Penhall, Joe, creator. *Mindhunter*. Los Gatos: Netflix, 2017–2019.
Pizzolatto, Nic, creator. *True Detective*. Los Angeles: HBO, 2014.
Tarantino, Quentin, dir. *Kill Bill: Vol. 1* and *Kill Bill: Vol. 2*. Los Angeles: Miramax Films, 2003–2004.
Wan, James, dir. *Saw*. Santa Monica: Lions Gate Films, 2004

Contacts

Contacts *(2000 characters)*

Other information

Other information