Subject name: Ceramics and Powder Metallurgy	Code EC: GMA09-CMP
Number of hours per student : 12h	ECTS Number: 1
Reference Teacher: Thierry GLORIANT	

Generalities

Objectives *(2000 characters)*

Acquisition of essential knowledge on ceramic materials and industrial alloys produced by powder metallurgy: manufacturing methods and mechanical properties. Knowledge of the main industrial manufacturing processes.

Description *(2000 characters)*

Definition. Generalities. Classification of ceramics. Traditional and technical ceramics. Examples of simple and complex ceramics. Binary and ternary phase diagrams. Ashby diagrams. Powder metallurgy shaping of industrial ceramics and alloys. Definition and description of the different sintering steps. Hot isostatic sintering. SPS sintering. Additive manufacturing. Mechanical behavior of sintered ceramics and alloys: ductility, brittleness, thoughness, creep mechanisms. Application properties.

Requirements *(2000 characters)*

Fundamentals of crystallography, phase diagrams, structural metallurgy and mechanical properties

Course requirements and assessments

Teaching Language *(2000 characters)*

French or English

Teaching methods *(500 characters)*

Lessons (illustrated by application exercises)

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

CM: 12h
TD:
TP:
PR:
CONF:
Autres:

Evaluation *(200 characters)*

Written test of 1h

Bibliography

Bibliography *(2000 characters)*

W.D. Kingery et al., Introduction to Ceramics, John Wiley et Sons, New-York (1976),ISBN0.471.47860.1. J.L. Chermant, Caractérisation des poudres et des céramiques, Hermès, Paris (1992), ISBN 2.86601.307.7. L.L. Hench, R.W. Gould, Characterization of Ceramics, M. Dekker Inc, New-York (1971), ISBN 0.8247.1302.8

Contacts

Contacts *(2000 characters)*

T. Gloriant (thierry.gloriant@insa-rennes.fr)

Other information

Other information

Cliquez ou appuyez ici pour entrer du texte.

Subject name: Optimal Control	Code EC: GMA09-COMOP
Number of hours per student: 24h (CM: 10h, TD: 6h, TP: 8h)	ECTS Number: 2
Reference Teacher: Sylvain GUEGAN	

Generalities

Objectives *(2000 characters)*

Optimal control aims to determine control laws that minimize a performance criterion for dynamic systems, whether related to energy, time, accuracy, or robustness. This module focuses in particular on Linear Quadratic (LQ) control, widely used for its efficiency and ease of implementation. The objectives are to: present the fundamental principles of optimal control for dynamic systems; introduce LQ control and its main properties; address robustness considerations; introduce LQG, H_2, and H∞ controls.

Description *(2000 characters)*

– Mathematics of optimal control: quadratic criteria, optimality conditions, associated equations.
– Optimal control of continuous and discrete linear systems: formulation of the quadratic problem, Riccati equation, continuous and discrete stationary controllers.
– Analysis of the relevance of LQ control: performance, stability, optimal cost/control trade-off, limitations, and model sensitivity.
– Quadratic optimization for continuous and discrete systems: practical aspects, constraints, numerical solutions.
– LQG control: combination of LQ regulation and Kalman filtering, handling of noise and measurement uncertainties.
– H_2 and H∞ control: explicit consideration of disturbances, robust performance objectives, introduction to H∞ synthesis.

Requirements *(2000 characters)*

GMA05-SYS ; GMA06-AUTO ; GMA07-AUTO2

Course requirements and assessments

Teaching Language *(2000 characters)*

French

Teaching methods *(500 characters)*

Lectures, tutorials on computer using Matlab/Simulink and practical lab sessions. Preparation required for tutorials and labs.

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

CM: 10h
TD: 6h
TP: 8h
PR:
CONF:
Autres:

Evaluation *(200 characters)*

Graded lab work.
Final 2-hour written exam on computer using Matlab/Simulink.
Final grade = (Lab grade + 3 × Exam grade) /4

Bibliography

Bibliography *(2000 characters)*

KWAKERNAAK H. SIVAN R., 1972, « Linear optimal control systems», John Wiley 1 Sons, Inc.
THOMAS Y., 1992 « Signaux et systèmes linéaires » 1991, Masson
DE LARMINAT Ph. 1993, « Automatique, commande des systèmes linéaires », Hermès.

Contacts

Contacts *(2000 characters)*

Sylvain GUEGAN

Other information

Other information

Target audience: 5GMA

Subject name: Robust Design	Code EC: GMA09-COROB
Number of hours per student: 24	ECTS Number: 2
Reference Teacher: Lionel LEOTOING	

Generalities

Objectives *(2000 characters)*

Numerous optimization approaches are now implemented during the development cycle of an industrial product. Such an approach can be applied at different scales (parts, sub-products, products) and at different stages of design. Despite the use of appropriate application solutions offering a wide range of optimization strategies, the choice of the optimized solution requires an assessment of its robustness. A solution is said to be robust if its response is little affected by small disturbances (dispersions in material characteristics, manufacturing tolerances, fluctuations in external stresses, etc.) around its ideal definition. A solution that is optimized but only works under very specific conditions will not be robust. A rigorous approach therefore consists of designing and dimensioning a product in a random context (including the random nature of the product's stress and resistance variables). Considering possible dispersions around a given configuration may lead to the estimation of the probability of occurrence of failure scenarios. In the latter case, calculating the probability of failure requires the evaluation of a reliability index.

Description *(2000 characters)*

- The reliability-based approach
- The main optimization algorithms
- Applications using ModeFrontier optimization software
- Mini-project

Requirements *(2000 characters)*

GMA07-CMAO

Course requirements and assessments

Teaching Language *(2000 characters)*

French

Teaching methods *(500 characters)*

Course presenting the basics of the reliability approach, case study using ModeFrontier software, mini-application project

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

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

Evaluation *(200 characters)*

1 supervised 2-hour assignment (weighted 2), project assessment in the form of a defense (weighted 1)

Bibliography

Bibliography *(2000 characters)*

Cliquez ou appuyez ici pour entrer du texte.

Contacts

Contacts *(2000 characters)*

Lionel LEOTOING, Eric COURTEILLE, Dominique GUINES

Other information

Other information

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Subject name: Engienering	Code EC: GMA09-INGAS
Number of hours per student: 24	ECTS Number: 2
Reference Teacher: Afia KOUADRI	

Generalities

Objectives *(2000 characters)*

The manufacturing processes for manufactured products often involve one or more assembly operations. In this sense, engineers must have a comprehensive understanding of manufacturing processes, assembly machines, how they work, and their limitations to take the best course of action and thus guarantee the reliability of the final product. The objective of this module is to provide engineers with the tools and methods they need to acquire expertise in the field of assembly engineering by considering the process, the assembly procedure, and the choice of materials in terms of metallurgy, thermal properties, and mechanical properties.

Description *(2000 characters)*

Course:
- Presentation and study of different welding processes, control of process parameters,
- Influence of processes and parameters on metallurgical and thermal aspects,
- Mechanical impacts and consequences on welded structures,
- Study of the Process-Material-Mechanics coupling,
- Assessment and recognition of the different types of defects generated by welding,
- Quality control of structures: destructive and non-destructive testing methods for welded structures,
- Study of the qualification process for welding engineers: QMOS and DMOS,
- Application and resolution methods for different welded systems: degree of qualification, expertise.

Practical work:
Assembly of plates using different welding processes. Students carry out a mechanical qualification to confirm the influence of the process on the final quality of the welding process. Various tests are carried out to highlight the process-material-mechanical coupling.

Requirements *(2000 characters)*

Cliquez ou appuyez ici pour entrer du texte.

Course requirements and assessments

Teaching Language *(2000 characters)*

French

Teaching methods *(500 characters)*

- 8 x 2-hour lecture courses
- 2 x 4-laboratory work

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

CM: 16
TD:
TP: 8
PR:
CONF:
Autres:

Evaluation *(200 characters)*

- 2-hour final exam (coefficient 2)
- Laboratory work (coefficient 1)

Bibliography

Bibliography *(2000 characters)*

Cliquez ou appuyez ici pour entrer du texte.

Contacts

Contacts *(2000 characters)*

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Other information

Other information

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Subject name: Materials Forming Mechanics	Code EC: GMA09-MECAFORM
Number of hours per student: 60.00 h	ECTS Number: 4.5
Reference Teacher: Adinel GAVRUS	

Generalities

Objectives

Analysis of the metallurgical structure of metallic materials, micro-plasticity, micro-macro coupling and structure-plastic behaviour, theory of plasticity of materials and continuous media, formulation of rheological and tribological laws, analysis of mechanical tests and description of the main metal forming processes. Analysis of the physicochemical structure of non-metallic materials, understanding of structure-behaviour interdependence, thermo-plasticity of polymers, molten polymer flow, hyper-elasticity of elastomers, and description of the main industrial processing methods. Application of the principle of Inverse Analysis, Integrated Design, and Optimal Material Selection. Development of skills for the design, modelling, optimization and numerical simulation of forming and processing methods for metallic and non-metallic materials.

Description

• Physical mechanisms of hardening
• Dislocations: concept, dynamics, structures
• Microstructures, Textures, Microplasticity
• Applications to the properties of industrial materials
• Elasto-Viscoplasticity, Theory and Criteria of Plasticity, Anisotropy
• Metallurgy of forming
• Rheology of forming
• Tribology of forming
• Forming of metals
• Inverse analysis
• Physical chemistry of polymers
• Structure-Rheological Behavior coupling
• Rheological laws of polymers in the molten state
• Thermal properties of plastic materials during flow in the solid and molten states
• Flow of polymers in the fluid state
• Processing of polymers in the molten state
• Constitutive laws in the solid state and mechanical and rheological analyses
• Behavior of elastomers
• Processing of elastomers

PART 1

- Scale Transition
- Hardening Mechanisms
- Dislocations: Concept, Dynamics, Structures, Dipoles
- Work Hardening Stages of Metals and Solid Solutions
- Textures
- Applications and Properties of Industrial Materials

PART 2

I. PLASTICITY AND ELASTO-VISCO-PLASTIC BEHAVIOR OF MATERIALS IN THE MODELLING AND SIMULATION OF FORMING OPERATIONS

- Review of Continuum Mechanics with Applications in Large Plastic Deformations
- Plasticity, Plasticity Criteria, and Associated Flow Laws
- Analog Models – Uniaxial Elasto-Plastic Constitutive Laws
- Elasto-Plasticity and Elasto-Viscoplasticity
- Elasto-Plastic Behavior and Incremental Formulation
- Viscoplastic Behavior and Variational Formulation

II. APPLICATIONS TO METAL FORMING

- Introduction to forming processes
- Structure of metals and alloys
- Rheology under large deformations
- Mechanical testing and stress analysis (tensile, torsional, compressive)
- Tribology of forming
- Role of friction in forming processes
- Friction testing
- Industrial processes: Forging, Rolling, Deep Drawing, Extrusion, Machining
- Numerical simulations using the finite element method with estimation of thermo-mechanical stresses

III. STUDY OF RHEOLOGICAL BEHAVIOR BY INVERSE ANALYSIS

PART 3

IV. APPLICATIONS TO POLYMER PROCESSING

- Introduction to polymer processing
- Physicochemical structure of polymers
- Understanding the structure-behavior interdependence
- Rheological behavior of polymers in the molten state
- Viscoplastic flows of polymers in the molten state
- Thermomechanics of polymers in the solid and molten states
- Industrial processes: Calendering, Injection Molding, Extrusion
- Estimation of thermomechanical stresses
- Mechanical testing and rheological behavior of polymers in the solid state
- Optimal material selection using performance criteria and automated selection software

Requirements

GMA05-MMC
GMA06-MDF
GMA08-CMAT

Course requirements and assessments

Teaching Language

French

Teaching methods

Lectures, tutorials, practical sessions and project : in-person sessions

Number of hours per course type:

CM :34.00 h
TD : 16.00 h
TP : 8.00 h
PR : 2.00 h
CONF :
Autres :

Evaluation

A supervised assignment grade (weighted 2/3) : 1-hour mid-semester written exam and 2-hour written final exam ;
A practical assignment grade (weighted 1/3) : assessment of practical work and project

Practical Work Report and Project Report DS : 2/3 ; TP : 2/9 ; PROJET : 1/9

Bibliography

Bibliography

[1] J. PHILIBERT A. VIGNES Y. BRECHET P. COMBRADE « Métallurgie du minerai au matériau » Ed Masson 1998
[2] D. FRANCOIS, A. PINEAU, A. ZAOUI, « Comportement mécanique des matériaux », Tome1, Hermes, 1995
[3] J-M. HAUDIN, F. MONTHEILLET, « Notions Fondamentales sur les Matériaux », Ed. S.N.P.M.D., Paris, 1989.
[4] M. BELLET, J-L. CHENOT, L. FOURMENT, E. MASSONI, P. MONTMITONNET, « Séminaire de Plasticité : Eléments Finis et Mise en Forme des Métaux », Ed. Ecole Nationale Supérieure des Mines de Paris, Sophia Antipolis, 1994.
[5] M. RAPPAZ, M. BELLET, M. DEVILLE, « Modélisation Numérique en Science et Génie des Matériaux », Ed. Presses Polytechniques et Universitaires Romandes, 1998.
[6] J. F. AGASSANT, P. AVENAS, J.-Ph. SERGENT, « La Mise en Forme des Matériaux Plastiques », Ed. Technique & Documentation, Ed. Lavoisier, 1996.
[7] J. BOST, MATIERES PLASTIQUES II : « Technologie – Plasturgie », Ed. Technique & Documentation, Lavoisier, 1982.
[8] M. REYNE, « LES MATERIAUX NOUVEAUX », Ed. Hermes, Paris, 1990.
[9] M. REYNE, « TECHNOLOGIE DES PLASTIQUES », Ed. Hermes, Paris, 1998.
[10] C. G'SELL, J.-M. HAUDIN, « INTRODUCTION A LA MECANIQUE DES POLYMERES", Ed. Institut National Polytechnique de Lorraine, 1995.

Contacts

Contacts

Adinel GAVRUS – Enseignant-Chercheur Titulaire INSA Rennes - 60 CNU/MESRI (adinel.gavrus@insa-rennes.fr)

Other information

Other information

Independent Personal Study - 1 hour per week

Subject name: Industrial project	Code EC: GMA09-PI
Number of hours per student: 94h	ECTS Number: 7
Reference Teacher: Romain FISCHESSER	

Generalities

Objectives *(2000 characters)*

The educational objectives of this module are to:
- apply the knowledge and skills acquired during the GMA program to solve an industrial problem
- strengthen students' knowledge of the business world
- prepare students for their future responsibilities as engineers

Description *(2000 characters)*

Each group, consisting of 1 to 2 students (maximum 4), must undertake a study proposed by an industrial partner. The proposed study must correspond to a real industrial need.
Each group is supervised by one or two faculty advisors. Students must schedule a weekly meeting with their faculty advisors.

In order to prepare them for their future responsibilities, the students are entirely responsible for managing the project.

Requirements *(2000 characters)*

GMA05-MSI : mechanics of non-deformable solids
GMA05-ARSM : Sizing and integration of mechanical components
GMA06-DICM : Sizing and integration of mechanical components
GMA07-CMAO : Computer-aided design
GMA07-AUTO2 : Automatic 2
GMA07-PUI : Power transmission
GMA08-PRCONS : Design project

Course requirements and assessments

Teaching Language *(2000 characters)*

French

Teaching methods *(500 characters)*

Each group is supervised by one or two teachers.
The teachers provide advice on the methodology to be used and help students to take a critical look at their results.
However, the organization of the work and the points of convergence with the industry remain the responsibility of the students.

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

CM: 0
TD: 0
TP: 0
PR: 80h
CONF: 14h (Project management)
Autres: 0

Evaluation *(200 characters)*

The Industrial Project grade is the average of two grades:
- the final report, determined by the supervising teachers.
- The final oral presentation, determined by the teachers and the industrial sponsor of the project.

Bibliography

Bibliography *(2000 characters)*

Construction mécanique, AUBLIN, CAHUZAC, FERRZA, VERNHERES
Guide des sciences et technologies industrielles, FANCHON
Eléments de machines, SZWARCMANN
Construction Mécanique Transmission de Puissance, ESNAULT
Mécanique du solide, AGATI P., BREMONT Y., DELVILLE G, Ed. Dunod
Liaisons et mécanismes, AGATI P., ROSETTO M., Ed. Dunod, 1994
Traité théorique et pratique des engrenages, HENRIOT G., tome 1, Ed. Dunod
Mémotech Productique, Conception et dessin, BARLIER C., BOUGEOIS R., Ed. Casteilla

Contacts

Contacts *(2000 characters)*

Cliquez ou appuyez ici pour entrer du texte.

Other information

Other information

Cliquez ou appuyez ici pour entrer du texte.

Subject name: Robotics	Code EC: GMA09-ROBOT
Number of hours per student:	ECTS Number: 2
Reference Teacher: Vigen ARAKELYAN	

Generalities

Objectives *(2000 characters)*

This course aims to deepen students' knowledge in robotics, with a particular focus on understanding the fundamental mechanical principles related to articulated systems, locomotion, and grasping. It presents the theoretical foundations required for the modeling and analysis of robots, while also introducing recent developments in the field. Special emphasis is placed on the forward kinematics problem, formulated in polynomial form, and on its corollary—the study of assembly modes in parallel robots. The course also covers inverse kinematics, statics, and dynamics of various parallel robot architectures, using modern analytical and computational methods, supported by numerous practical examples. The theoretical component is complemented by tutorial sessions, during which students develop robotic application simulation models using the ADAMS software.

Description *(2000 characters)*

Statics of anthropomorphic manipulators and parallel structures. Forward and inverse kinematics of parallel manipulators. Motion generation in joint and operational spaces: polynomial interpolation and minimum-time trajectory planning. Newton–Euler and Lagrange equations: applications to robotic systems. Balancing of manipulator arms and parallel robots: applications to gait-assist systems and manual manipulators. Dynamic decoupling and linearization of the equations of motion for open-chain manipulators.

Requirements *(2000 characters)*

Strong skills of the fundamentals of mechanics and general robotics is required. Students are expected to have prior knowledge in the following areas: Rigid-body mechanics: kinematics and dynamics of rigid bodies, mechanical joints, and degrees of freedom. Applied mathematics: linear algebra, differential equations, and vector calculus. Computer science and numerical simulation: fundamentals of computer-aided modeling and simulation (using software such as ADAMS or MATLAB). Mechanical design: schematic representation, functional analysis, and understanding of articulated systems. Familiarity with the fundamental concepts of robotics—including forward and inverse kinematics, the Denavit–Hartenberg method, and manipulator architectures—constitutes a valuable asset for successfully following the course.

Course requirements and assessments

Teaching Language *(2000 characters)*

French and English

Teaching methods *(500 characters)*

Lectures: 16 hours

Tutorials (TD): 8 hours

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

CM: 16h
TD: 8h
TP: -
PR: -
CONF: 2h
Autres:

Evaluation *(200 characters)*

2-hour supervised exam; tutorial notes

Bibliography

Bibliography *(2000 characters)*

1. Angeles, J. (2020). Fundamentals of Robotic Mechanical Systems: Theory, Methods, and Algorithms.
2. Merlet, J.-P. (2006). *Parallel Robots*.
3. Tsai, L.-W. (1999). Robot Analysis: The Mechanics of Serial and Parallel Manipulators.

Contacts

Contacts *(2000 characters)*

Vigen ARAKELYAN

Tél.: 02 23 23 84 92

Mail: vigen.arakelyan@insa-rennes.fr

Other information

Other information

Cliquez ou appuyez ici pour entrer du texte.

Subject name: CONFERENCE	Code EC: GMA09-SPEC
Number of hours per student: 26 h	ECTS Number: 2
Reference Teacher: André BURGUIERE	

Generalities

Objectives

The main objectives of this EC are to :

- understand the **operational and technological challenges** encountered in industry through two themes: project management and mobile robotics ;
- develop the ability to **analyse industrial feedback** and make the link between theory and practical applications ;
- strengthen **engineering culture**: technical choices, real constraints, standards, responsibility and decision-making.

Description

Two expert engineers will speak on the following topics :

Project management

1 - Introduction to project management
Challenges, success rates, notable industry examples and the role of project management in controlling objectives, deadlines, costs and risks.
2 - Project fundamentals
Definition, characteristics (uniqueness, limited duration, QCD, uncertainty, etc.), types, stakeholders (project owner, project manager, project team, partners) and four-phase life cycle.
3 - Phase 1 – Preliminary design
Development of the scope document: context, objectives, challenges, risks, schedule, organisation, leading to the Go/No Go decision.
4 - Phase 2 – Defining a project
8-step method: understanding the context, formulating the problem, QCD objectives, structuring (WBS, deliverables, milestones), planning, budget, risks, communication. Production of the project contract.
5 - Phase 3 – Steering
Monitoring of indicators (costs, deadlines, quality), analysis of deviations, decisions, action plans, facilitation of meetings and visual management.
6 - Phase 4 – Closure
Validation of deliverables, closure file and feedback.
7 - Introduction to agile methods
Presentation of agile principles and comparison with the traditional approach.

Mobile robotics

1 - Understanding fundamental concepts
- Present an overview of mobile robotics and its areas of application.

2 - Localisation and perception
- Understand the use of proprioceptive and exteroceptive sensors for localisation.
- Be able to compare different technical solutions and identify the selection criteria for a given application.

3 - On-board energy management
- Know the energy sources that can be used in mobile robotics and their constraints.
- Gain an in-depth understanding of how batteries work, their sizing, use and safety rules.

4 - Kinematics and architecture of mobile vehicles
- Understand the different kinematic architectures.

- Be able to identify the advantages, limitations and selection criteria according to operational needs.

5 - Robotic system safety

- Distinguish between the concepts of machine safety and functional reliability.
- Understand the principles of implementing safety functions in a mobile robot.

6 - Standards and guidelines

- Discover the role of standards and guidelines in the design of robotic systems.
- Clarify certain preconceived ideas and understand the reality of their industrial application.

7 - Case study: the autonomous car

- Analyse a complex system to illustrate:
  - the impact of technical choices,
  - safety constraints,
  - regulatory implications,
  - designer responsibility.
- Understand the importance of a rigorous development process, from prototype to industrialisation.

Requirements

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Course requirements and assessments

Teaching Language

French

Teaching methods

Project management:

- two half-days (3.5 hours) at the beginning of the semester
- one day (7 hours) in the middle of the semester

Mobile robotics: three half-days of 4 hours.

Number of hours per course type:

CM: 0
TD: 0
TP: 0
PR: 0
CONF: 26 h
Autres: 0

Evaluation

Validation without marks

Bibliography

Bibliography

Contacts

Contacts

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Other information

Other information

Cliquez ou appuyez ici pour entrer du texte.

Subject name: Mechanical Systems	Code EC: GMA09-SYSME
Number of hours per student:	ECTS Number: 2
Reference Teacher: Vigen ARAKELYAN	

Generalities

Objectives *(2000 characters)*

The design and development of modern machines require engineers to master the concepts and techniques of complex mechanical systems. The primary objective of this course is to introduce the fundamental methods and principles for the analysis and synthesis of articulated rigid multibody systems. Over the past two decades, research in mechanical systems has significantly advanced the field through the development of new analytical and numerical methodologies. Building on these developments, this course enables students to strengthen and deepen their understanding of multibody system mechanics, both from a theoretical and practical perspective. All methods presented are illustrated through numerous industrial applications, bridging the gap between theoretical knowledge and modern engineering practice.

Description *(2000 characters)*

Study of singularities - both kinematic (Gosselin–Angeles method) and dynamic. Kinematic analysis of spatial mechanisms with closed kinematic chains. Synthesis of articulated multibody systems for the approximate reproduction of a prescribed motion (Roth–Gupta method). Dynamic synthesis, including optimization of driving torques and optimal balancing based on the Chebyshev approximation. Dynamics of multibody systems with closed kinematic chains and multiple degrees of freedom. Mechatronic approaches for the modeling, analysis, and control of mechanical systems.

Requirements *(2000 characters)*

General and rigid body mechanics: fundamentals of kinematics and dynamics of rigid bodies, joints, and degrees of freedom. Applied mathematics: matrix algebra, differential equations, and vector calculus. Computer science: fundamentals of modeling and numerical simulation (using ADAMS and MATLAB). Mechanical design principles: schematization, functional analysis, and understanding of articulated systems.

Course requirements and assessments

Teaching Language *(2000 characters)*

French and English

Teaching methods *(500 characters)*

Lectures: 16 hours

Tutorials (TD): 8 hours

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

CM: 16h
TD: 8h
TP: -
PR: -
CONF: 2h
Autres:

Evaluation *(200 characters)*

2-hour supervised exam; tutorial notes

Bibliography

Bibliography *(2000 characters)*

1. L.W. Tsai. Mechanism Design. CRC Press, 2001, 311p.
2. H. Dresig., F. Holzweißer. Maschinendynamik. Springer, 2004, 526p.
3. O. Bottema, B. Roth. Theoretical Mechanics. Dover Publications, New York, 1990, 558p.

Contacts

Contacts *(2000 characters)*

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Other information

Other information

Cliquez ou appuyez ici pour entrer du texte.

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