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For information on the PARISTECH : http://www.paristech.org

The ATHENS European Network and the «Semaine européenne»

Le réseau européen ATHENS et la Semaine européenne

Presentation and Objectives

Created in 1996, the ATHENS Network is composed of ten European technological universities or institutions : the Universities and Technical Institutions of **BUTE** Budapest, **TU D**elft, **KU L**euven, **IST** Lisbon , **UCL** Louvain-la-Neuve, **UP M**adrid, **Politecnico Milan,** TU Munich, **CTU** Prague, **NTNU** Trondheim, **TU Vienna**, and the "Grandes Ecoles d'Ingénieurs" Group (ParisTech) which includes eleven Grandes Ecoles **(ENGREF, ENPC, ENSAE, ENSAM, ENSCP, ENSMP, ENST, ENSTA, ECOLE POLYTECHNIQUE, ESPCI, INAPG).**

The principle goal of the Network is to facilitate the exchange of students, professors and researchers among the major European technological universities and to participate together under European technological development and training programmes.

One of the Network's first and most unique actions concerns the organisation of an intensive course programme given at each member institution during one of two defined periods ("Sessions") of the academic year (November and March). This training activity, called ATHENS (Advanced Technology Higher Education Network/SOCRATES).

Each Session, **includes both 30 hours of scientific courses work (see page 21 for the courses offered) as well as 10-15 hours of "European Dimension" activities (see pages 7-9).** At the termination of an ATHENS Session, the Home Institution officially recognises the work carried out, according to the results obtained on an examination organised by the Host Institution and evaluated according to its proper system of grading. **Each complete Session is worth 1.4 to 3 ECTS credits.**

Though ATHENS is a relatively new SOCRATES activity this intensive course system is based on two successful past experiences:

- That of the ParisTech "Semaine Européenne", a 5-day long scientific intensive course programme set up between 1992 and 1999 among 9 of the 10 ParisTech institutions and under which some 1200 students annually participate in the intensive courses offered.

- That of the Leuven Network ERASMUS Programme: between 1990 and 1997, students from each institution were annually exchanged to follow an intensive course in the area of Telecommunications at a member institution. Over 150 students participated each year in this programme.

ATHENS is an enlarged version of these two programmes.

The objective of the ATHENS Programme is that of giving students, coming from one Institution, the possibility of knowing another European pedagogical system. The Programme permits students, from different institutions to briefly integrate into courses of a high scientific level. When possible local students participate in these courses. This experience, in many cases, gives students the desire to carry out studies of a longer duration (Master or Phd level) at an institution different from their Home Institution and thus favours exchanges between students of the major European technological institutions.

The ATHENS Programme, was established with support of the European Communities SOCRATES Programme, receiving an annual subsidy of 50 000 Euros from 1997-2001. Today the Programme continues to be financed by the members institutions with the help of industrial partners and local authorities.

Organization and Registration for Courses

The list and characteristics of the various courses proposed for the ATHENS Session, March 12-19, 2005, are given in this brochure on page **21-58**

In order to participate in the Session, candidates are asked to do the following :

- choose three possible courses in order of priority, taking into account the background knowledge required in order to fully benefit from the course selected (additional information can be obtained from the professor organising the course, see the Course Description, and by consulting professors at the Home Institution). ParisTech students will be asked to make up to six choices, depending on their institution.

- complete the Registration Form on the Web (found on either : http://www.paristech.org or on http://www.intersek.ntnu.no/athensreg/defaulte.htm) and indicate, in addition to the course selected as a first choice, a " second choice course and third choice " in order to have a strong chance of participating in the Session. ParisTech students will be asked to complete up to six choices , depending on their institution.

- complete, print out and sign the the Registration Form and the Commitment and return both forms to the International Office of your Home Institution. This Office is in charge of verifying that candidates have sufficient knowledge to follow the courses selected and in then transmitting this information both to the institution where the course will be taught and to the Central ATHENS Office (the International Office of the ParisTech).

- take special note of the dates, hours and different European Dimension Programmes organised at each institution. As previously indicated, these programmes are an integral part of an ATHENS Session (further details are given on pages **8-9**).

- **Attention.** Once you have received official acceptance for the ATHENS March 2005 Session, your registration is considered as definite. Only in the case of major unforeseen circumstances will Home Institutions permit their students to cancel registration. **Last minute cancellations can be costly : students may be asked to pay local expenses entailed by the course institution and the cost of housing reserved for them.**

- **According to your nationality, verify the visa requirements for the destinations you have chosen.**

The deadline for each ATHENS Member Institution to send each of the individual Registration Forms is

Consult your local ATHENS Coordinator

The official decision of Acceptance of Candidates for a course will be communicated to Member Institutions on

February 4, 2005

No charge is made to students to follow a course. Travel and Living costs are, however, the responsibility of the participating students and their Home Institution. See the section on Financial Conditions for more details.

Housing, Travel and Living Costs for the 5 day courses and the European Dimension Programme

Housing:
Institutions organising courses will make the necessary housing arrangements for participating students who desire lodging during a Session (please complete the questions concerning this item on the ATHENS Application Form). Housing and living costs will be kept to a minimum. As a result, students, requesting such local housing, must expect to find very "simple" forms of lodging. **Once reservations have been made for students in local housing, these reservations cannot be changed except for major reasons.**

Travel:
Travel costs, by bus, second class train or special reduced group flights costs from one institution to an other vary tremendously, with a trip from Lisbon to Trondheim being the most extreme example. ATHENS Home Institutions will assist students in finding the cheapest rate possible. Below are few examples:

Leuven-Paris-Leuven	**50 Euros (bus)**
Delft-Louvain-Delft	**68 Euros**
Madrid-Paris-Madrid	**240 Euros**
Madrid-Lisbon-Madrid	**310 Euros**
Paris-Louvain-Paris	**90 Euros (train)**
Paris-Trondheim-Paris	**399 Euros**
Paris-Budapest-Paris	**361 Euros**
Paris-Milan-Paris	**120 Euros (train)**
Prague-Leuven-Prague	**319 Euros**

European Dimension Activities

The purpose of these activities, organised to complement the course a student follows, is to permit ATHENS students to better know the course organising institution, its faculty, as well as the foreign European city where the course is held. **Of special importance is the possibility to mix with students of different nationalities and backgrounds during these European Dimension activities.**

Several types of activities take place:

- Visits to quarters and museums of the city or local area
- Visits to special exhibitions
- Concerts
- Informal activities and social events to permit visiting ATHENS students to meet with local students
- Student industrial forum to bring students into contact with the professional world

On the next page is a brief summary of the type of programme organised at each ATHENS site. **Please take note of when these programmes begin and terminate. This information will be necessary for participating students in order to make their travel arrangements**. A detailed programme for each site participating in the March 2005 Session will be available on the ATHENS Web site (http://www.paristech.org) some nine days prior to the start of the Session.

SITE	PROGRAMME BEGINS	PROGRAMME TERMINATES	BRIEF DESCRIPTION OF PROGRAMME
BUDAPEST	11:OO, Saturday morning, March 12	Saturday morning March 19	Bus tour of city, Parliament & Castle area, boat trip and lunch on Danube, concert, theatre or opera, closing dinner with folk show.
DELFT	10.00, Saturday March 12	11.00 Saturday March 19	Tour of Delft, Amsterdam, visit museum (Van Gogh) tour of Amsterdam, concert, trip to the Deltawerken, visit to Scheveningen, visit to Rotterdam
LOUVAIN LA NEUVE	14.00 Saturday morning, March 12	12:30 Saturday, March 19	Visits of Louvain-la-Neuve, Welcome reception, Dinner in Bruxelles, Excursion to Bruges, Visit of Bruxelles, Evening organised by U.C.L. students
LISBON	**NO SESSION ORGANISED IN MARCH**		
KUL LEUVEN	**NO SESSION ORGANISED IN MARCH**		
MADRID	12:30 Saturday morning, MARCH 12	Saturday morning, MARCH 19	Reception and informal visits to the old city of Madrid, to the most important museums, special monuments, a concert, Thursday international evening "making friends"
TU MUNICH	12:00 Saturday morning, March 12	Saturday morning, March 19	Reception and sightseeing-tour Munich, visit to the German museum, bus-tour to upper-Bavaria.
PARIS	11:00, Saturday morning, March 12	14:00, Saturday, March 19	Reception & Informal visits of Paris with ParisTech students, visits to special quarters of Paris and famous museums, visits to special temporary exhibitions, a boat trip, International evening. Thursday evening FORUM to meet international companies (bring a cv)
PRAGUE	12:00 Saturday morning, March 12	Saturday morning March 19	Reception and informal visits to the old city of Prague, visit to museums and monuments international evening "making friends", bus tour to see the Czech countryside, excursion

European Dimension			
POLITECNICO MILAN Campus Leonardo Courses in MILANO	12.00 Saturday, MARCH 12	Saturday early afternoon, MARCH 19	Saturday: Reception, guided visit of Milano Sunday: guided visit of the Castle and its dungeons organized by the students association. During the week: visits of some important Museums Friday: special "aperitivo" organised by the students association and night tour of the city by an old Milanese tram
POLITECNICO MILANO Campus COMO **Course in COMO**	15:00 Saturday afternoon, MARCH 12	Saturday morning, MARCH 19	Saturday: Reception, guided visit of Como, welcome dinner. On Sunday trip and lunch on the hills or another activity arranged by the student organisations, During the week: visit to two firms operating in the textile and furniture industry, party with buffet (offered by the Polo Regionale di Como and Lagru student association) , guided visit of Terragni's exibition on Saturday morning,
NTNU	**NO SESSION ORGANISED IN MARCH**		
TU VIENNA	14.00, Saturday, March 12	Morning Saturday, March 19	Welcome meeting, sightseeing-tour Vienna, evening at a "Heurigen-Restaurant", theatre and/or opera visit together with local student groups (BEST)

Financial Conditions for ATHENS Candidates

The following figures listed below will give students an idea of "living expenses" involved in an ATHENS session. The cost are a three types :

- hostel costs (to be paid in cash, in the currency of the receiving country)
- lunch and evening meals
- social and cultural, "European Dimension" activities

These costs are estimated as follows by the various institutions : (see page 14/15)

Financial Aid for Participating students

Interested ATHENS candidates should consult the international office at their Home Institution in order to obtain information on possible local bursaries or financial aid offered.

Présentation et objectifs

Créé en novembre 1996, le réseau ATHENS se compose de dix universités ou institutions technologiques européennes : **BUTE** Budapest, **TU D**elft, **KU L**euven, **IST** Lisbon, **UCL** Louvain-La-Neuve, **UP M**adrid, **Polytecnico Milan**, le TU Munich, **CTU** Prague, **NTNU** Trondheim, le **TU Vienne** et de PARISTECH qui rassemble dix « Grandes Ecoles d'Ingénieurs » de Paris **(ENGREF, ENPC, ENSAE, ENSAM, ENSCP, ENSMP, ENST, ENSTA, ECOLE POLYTECHNIQUE, ESPCI, INAPG).**

Le réseau a pour objectif principal de faciliter les échanges d'étudiants, d'enseignants et de chercheurs entre les grandes universités technologiques européennes et de participer ensemble aux grands programmes européens de développement technologique et de formation.

Une des premières actions du réseau concerne la mise en place d'un programme de cours intensifs dispensés dans chaque institution membre durant une des deux périodes (sessions) définies de l'année universitaire (novembre et mars).

Cette activité de formation, dénommée sous le sigle ATHENS (Advanced Technology Higher Education Network/SOCRATES), s'inscrit dans le cadre du programme européen SOCRATES/ERASMUS.

Chacune des sessions **inclut 30 heures de cours scientifiques (voir page 21 pour la liste des cours proposés) et 10 à 15 heures d'activités de « Dimension européenne » (voir page 11/12)**.

A la fin de chacune des sessions, l'enseignement est validé par l'institution d'origine suivant le résultat obtenu au contrôle de connaissances organisé par l'institution d'accueil selon ses propres critères d'évaluation. **Chaque session complète équivaut à 1.4 à 3 crédits ECTS**.

Ces programmes de cours intensifs, bien que relativement nouveaux, tirent parti de deux expériences passées réussies :

- celle de la « semaine européenne » de ParisTech. Cette activité d'échanges entre élèves de neuf des dix grandes écoles d'ingénieurs de Paris, débutée en 1992, draine chaque année de l'ordre de 1200 élèves ingénieurs qui suivent les enseignements organisés pendant une semaine de cours intensifs (30 heures de cours sur 5 jours) deux foix par an, en novembre et en mars.

- celle du « Leuven Network » dans le cadre de l'ancien programme ERASMUS, qui une fois par an, entre 1990 et 1997, a permis à 150 étudiants de ce réseau de suivre un cours intensif dans le domaine des télécommunications.

Le programme intensif dit ATHENS est une version nouvelle et enrichie de ces deux actions.

L'objectif recherché est de donner l'occasion aux étudiants provenant d'une autre institution de connaître un autre système pédagogique en s'intégrant brièvement à des enseignements de haut niveau scientifique suivis par des élèves d'établissements différents. Dans la mesure du possible, les étudiants de l'institution d'accueil suivent également ce cours. Cette expérience devrait susciter l'envie d'effectuer ultérieurement un séjour de plus longue durée (au niveau 3ème cycle notamment) dans une institution différente de l'institution de provenance de l'étudiant, et favoriser ainsi les échanges entre les élèves des grandes universités technologiques européennes.

Le programme intensif ATHENS fut établi avec le soutien de la Commission européenne dans le cadre du programme SOCRATES/ERASMUS qui lui a accordé entre 1997 et 2001 une subvention annuelle de 50 000 Euros. Aujourd'hui ATHENS continue à bénéficier du financement des institutions membres ainsi que de l'aide offerte par des entreprises et des autorités locales.

Organisation et modalités d'inscription

La liste et les caractéristiques des différents cours proposés, pour la session de mars du programme intensif ATHENS, 12-19 mars 2005, sont données dans le présent fascicule à la **21-58.**

Pour participer à la semaine, il convient :

- d'effectuer le choix de trois de ces cours, en tenant compte en particulier des "connaissances préalables requises" pour pouvoir suivre avec profit le cours envisagé (des renseignements complémentaires peuvent être obtenus auprès du responsable du cours) ; les étudiants de ParisTech doivent sélectionner jusqu'à six cours, selon leur institution d'origine.

- de remplir le formulaire d'inscription sur Web (dont le modèle se trouve soit à http://www.paristech.org, soit à http://www.intersek.ntnu.no/athensreg/defaulte.htm) en indiquant, en plus de votre choix principal de cours, un second et troisième choix dans l'éventualité d'un manque de places disponibles dans le cours du premier choix (de cette façon un candidat augmente ses chances d'acceptation). Les étudiants de ParisTech seront invités à faire jusqu'à six choix selon leur instition d'origine.

- signer votre formulaire ainsi que l'Engagement.

- de remettre le formulaire rempli à la direction des études de votre établissement, lequel se chargera de le faire parvenir à la direction des études de l'École organisatrice du cours retenu en premier choix.

- bien noter les dates et heures du programme de Dimension Européenne organisé par l'Institution où vous suivrez votre Session. Ainsi que nous l'avons souligné plus haut, ce programme fait partie intégrante d'une session ATHENS (détails page **13**)

- **ATTENTION : dès reception de votre confirmation officielle vous serez définitivement inscrit pour suivre la Session ATHENS mars 2005**. Seul un cas de force majeure ou des circonstances exceptionnnelles permettront aux responsables locaux de donner leur approbation pour annuler cette inscription. **Une annulation de dernière minute coûte cher :** il pourra être demandé à l'étudiant de payer les frais engagés par l'institution d'accueil ainsi que le paiement du logement qu'on lui aura réservé, si son annulation n'est pas valablement justifiée.

- **suivant votre nationalité, bien vérifier des formalités de visa à accomplir pour les différentes desinations choisies**.

La date limite de renvoi de la fiche individuelle de demande d'inscription par l'établissement d'origine est le :

Voir au niveau de votre institution

La décision d'acceptation de l'inscription sera communiquée le :

4 février 2005

La participation au cours ne comporte pas de frais d'inscription. Les frais de voyage et de séjour sont à la charge des étudiants (éventuellement aidés par leur établissement d'origine).

Logement, Voyage et Frais de Séjour (cinq jours de cours, plus le programme de Dimension Européenne)

Logement :
Les institutions proposent les cours, organisent l'hébergement des étudiants désireux de se loger durant la session (merci de compléter les rubriques concernées dans la fiche d'inscription). Les frais d'hébergement et de séjour seront réduits au minimum. Ce qui implique que les étudiants, qui s'engagent dans ces conditions, doivent s'attendre à un logement sommaire .
Par ailleurs une fois que la réservation est faite, aucun désistement ne sera accepté sauf pour des **raisons majeures.**

Voyage :
Les frais de voyage varient considérablement d'une destination à l'autre, le coût de la liaison entre Lisbonne et Trondheim donnant un exemple du trajet le plus cher. Chaque établissement propose à ses étudiants le tarif de transport le plus avantageux. A titre d'exemple, nous pouvons citer les destinations suivantes :

Leuven-Paris-Leuven	**50 Euros (car)**
Delft-Louvain-Delft	**68 Euros**
Madrid-Paris-Madrid	**240 Euros**
Madrid-Lisbon-Madrid	**310 Euros**
Paris-Louvain-Paris	**90 Euros (train)**
Paris-Trondheim-Paris	**399 Euros**
Paris-Budapest-Paris	**361 Euros**
Paris-Milan-Paris	**120 Euros (train)**
Prague-Leuven-Prague	**319 Euros**

Activités de dimension européenne :

Le but de ces activités, organisées en complément des cours, est de permettre à l'étudiant ATHENS de mieux connaître l'institution qui l'accueille, ainsi que la ville européenne dans laquelle il se trouve. Une importance particulière est donnée à l'opportunité qui est fournie aux étudiants ATHENS de pouvoir s'intégrer à un groupe mixte d'étudiants de nationalités et formations différentes, au cours de ces activités de dimension européenne.

Plusieurs activités sont proposées :

- Visite des quartiers et de Musées de la ville et alentours
- Visites d'expositions temporaires ou permanentes
- Concerts
- Activités informelles et événements sociaux pour permettre aux étudiants visiteurs ATHENS de rencontrer les étudiants locaux.
- Forum industriel pour une prise de contact des étudiants avec le monde professionnel

Ci-après, un résumé succinct du type de programme organisé par chaque site ATHENS. **Veuillez noter les horaires et dates du début et de la fin du programme culturel vous concernant. Ces informations sont décisives pour décider de votre calendrier de voyage.** Un programme culturel détaillé pour chacun des sites participants à la session de Novembre 2004 sera disponible sur le site Web (httop://paristech.org) , dix jours avant le début de la session.

Dimension Européenne

SITE	Debut du PROGRAMME	Fin du PROGRAMME	DESCRIPTION
BUDAPEST	11:OO, Samedi matin, 12 Mars	Samedi matin , 19 Mars	Tour de la ville en bus, Parlement et environs du chateau, balade en bateau et repas sur le Danube. Soirée littéraire et musicale, concert, théâtre ou opéra après le dinner.
DELFT	10.00 Samedi matin 12 Mars	11.00 Samedi 19 Mars	Tour de la ville de Delft, visite d'Amsterdam, visit du musée Van Gogh. Tour de la ville d'Amsterdam, concert. Voyage à Deltawerken, Visite de Scheveningen, Visite de Rotterdam
LOUVAIN LA NEUVE	14.00 Samedi 12 Mars	Samedi matin 19 Mars	Visite de Louvain-la-Neuve, Accueil - Reception. Dîner à Bruxelles, excursion à Bruges, Visite de Bruxelles. Soirée organisée par les étudiants de UCL.
LISBONNE	**Pas de Session organisée en Mars**		
KU LEUVEN	**Pas de Session organisée en Mars**		
MADRID	12:30 Samedi matin, 12 Mars	Samedi matin, 19 Mars	Accueil et visites informelles dans le vieux Madrid, visite des Musées, découverte des monuments spéciaux, concert, jeudi : soirée internationale pour "se faire des amis".
TU MUNICH	12:00 samedi matin, 12 Mars	Samedi matin 19 Mars	Réception, visite guidée de Munich, visite du musée allmand, tour en car de Bavière du
PARIS	11:OO, Samedi matin, 12 Mars	14:00, Samedi, 19 Mars	Reception-Accueil & visites informelles dans Paris avec des étudiants de ParisTech. Visites organisées dans plusieurs quartiers de Paris ou Musées renommés, expositions temporaires, traversée de Paris en bateau. Jeudi soir FORUM pour rencontrer des entreprises internationales (Apporter : CV).
PRAGUE	12.00 Samedi matin 12 Mars	Samedi matin, 19 Mars	Accueil et visites informelles du vieux quartier de Prague, des plus importants musées, monuments de la ville. Soirée internationale pour "se faire des amis". Visite de la campagne en car,visite d'un château..
POLITECNICO DE MILAN Campus Leonardo Cours à MILAN	12.00 Samedi matin 12 Mars	Samedi matin, 19 Mars	Samedi : Réception-accueil & visite guidée de Milan de Milan. Dimanche : visite guidée du château et ses donjons organisée par l'assoc. des étudiants. Pendant la semaine : visite des muséees importants. Vendredi : apéritif organisé par l'assoc. des étudiants et tour de nuit dela ville en vieux tramway.
POLITECNICO DE MILAN Campus COMO Cours à COMO	15.00 Samedi après midi 12 Mars	Samedi matin, 19 Mars	Samedi : Réception & visite guidée de Como, dîner d'accuei. Dimanche : excursion et déjeuner à la campagne ou autre activité organisée par l'assoc. des étudiants. Pendant la semaine, visite de 2 entreprises travaillant dans le domaine du textile et des meubles ; soirée avec buffet (offerte par la Région de Como et Assoc. Lagru des étudiants),.Samedi matin : visite guidée de l'expo de Terragni.
NTNU	**Pas de Session organisée en Novembre**		
TU VIENNA	14.00, Samedi, 12 Mars	Matin Samedi 19 Mars	Reception-Accueil, visite de Vienne, soirée au "Heurigen-Restaurant", visite de théâtre et/ou de l'opéra avec des étudiants de TUW (BEST)

Conditions financières d'une session ATHENS

Frais de séjour pour une session ATHENS :

- hôtel, (qui doit être payé en espèces dans la monnaie du pays d'accueil)
- repas de midi et du soir,
- activités socio-culturelles à dimension européenne.

Ces coûts sont estimés de la manière suivante : (voir page 14/15)

Financements offerts aux étudiants participants :

Les candidats ATHENS intéressés par cette possibilité sont invités à prendre contact avec le bureau international de leur institution d'origine afin d'obtenir les renseignements sur des bourses ou des aides offertes.

COMPARISON OF COSTS AT THE DIFFERENT ATHENS SITES

COUTS COMPARES SUR LES DIFFERENTS SITES ATHENS

SITE	BED & BREAKFAST	2 MEALS A DAY	LOCAL TRANSPORTATION	EUROPEAN DIMENSION ACTIVITIES
Stay A* ***(8 nights)***	**From 11 evening to 19 March morning**	**14 Meals**		
Stay B* ***(8 nights)***	**From 11 evening to 19 March afternoon**	**15 Meals**		
*Stay C** *(9 nights)*	**From 11 evening to 20 March morning**	**16 Meals**		
BUDAPEST	**A*** For 8 nights : **128 Euros**	7 meals for free // **4,20 Euros per mea**	**28 Euros & Airport transfers : 17 Euros**	**52 Euros**(French Hungarian literary evening Entrance fee Thermal bath / Entrance fee Parliament / Guides / Course dossier)
DELFT	**A*** Two prices : **110 Euros & 125 Euros,** depending on accomodation	Lunches & evening meals : **55 Euros** // individual meal = **5 Euros** on Campus	None	**50 Euros**
LEUVEN	**A***For a total of **105 EURO**	**A total of 80 Euros**	**A total of 10 Euros**	**Free**
LISBON	**B* 8 x 12,5= 100 Euros**	Individual meal **1.80 Euros** on Campus (lunches & evening meals)	8 days transportation (metro) : **4,50 Euros**	**35 Euros (one meal included)**
LOUVAIN	**A***7 nights = **210 Euros**	**10 Euros per day** in University canteen	None	**15 Euros**
MADRID	**A** 15 Euros per nights = **120 Euros**	**10 Euros per day**	**A total of 18 Euros**	**12 Euros**
MUNICH	**A*** 4-6 bedroom 25 € per night incl. breakfast 200 € total (8-bedroom 19 € per night)	**4 € per meal** in University canteen	Metro/Tram: Card/week 11,70 € Card/single 2,10 €	**50 Euros**

COMPARISON OF COSTS AT THE DIFFERENT ATHENS SITES continued
COUTS COMPARES SUR LES DIFFERENTS SITES ATHENS suite

MILAN	**B*** Sat. to Sat. 210€ (=30*7) An extra night on Friday is possible If requested	1 meal on campus in University Canteen (onl Lunch) About 6.00€ **Dinner**: from Tuesday to Thursday Possibility ofentrance in a Club, "aperitivo" included (typical Milanese sort of dinner) for free with students association card.Drinks to be paid. Any other place, minimum cost 10€ per meal	In Milan : a 10-ticket carnet 9.20€ (a minimum of 2 carnets will be required **Airport transfer** From Malpensa:Malpensa express to Cadorna Station= 9 E. Malpensa Shuttle Air Pullman to Central Station =4.50 E /From Linate:Bus 73 to S. Babila= 1€	**32 Euros (1 meal included)**
COMO	**B*** Sat. to Sat. = **140 to 175 Euros** (=7X20: shared bathroom; 7X25: private bathroom Euros per night *rooms at 20 Euros per night for the first 15 reservations*) Breakfast will be offered for min. 30 participants only: about 28 Euros oft one week: An extra night on Friday is possible upon availability	1 meal (lunch) on campus – university canteen: **about 6 Euros**; 1 evening meal at Il Merendero **about 10/11 Euros.** *(at Il Merendero students can also bu what they want and pay individually*)	10 runs/local transportation: 9.5 Euros (1 run= 0.95 Euros) Malpensa airport tranfer: a) Shuttle bus to ComoReturn ticket 22 Euros OR b) Malpensa express train to Saronno round trip 7 Euros + Saronno-Como train round trip 4.10 Euros. **Linate airport transfer**Bus 73 to Milan 11 Euros Round trip Milan-Como train round trip 6.80 Euros **Orio al Serio airport transfer** shuttle to Bergamo round tripet trip 3 Euros Bus to Como returnticket 8.60 Euros **of 10 Euros**	**30 Euros**
PARIS	**B* 144 to 176 Euros**	**91 Euros** for 7.5 day (2 meals included)	Unlimited travel : a total of **26,40 Euros** in Paris / **29 Euros** for students going to ENPC	**10 Euros**
PRAGUE	**A* 120 Euros** (15 Euros per night)	**A total of 60 Euros**	**A total of 10 Euros**	**30 Euros**
TRONDHEIM	**C* 25 Euros per night (9 nights = 225 Euros**	**10 Euros** for two me x 8 = **80 Euros**	**A total of 15,50 Euros** for two way airport transportation / otherwise no transportation cos	**30 Euros (two meals included). Bus trip to student cabin : 6 Euros**
VIENNA	**A* max 20 Euros, per night (= max. 160 Euros**, in tot	**4 Euros**-/lunch (student restaurant)	Airport-bus: **6 Euros,-** Card/Week: **12,50 Euros** Card/Single: **1,50 Euros**	**approx. 20 €** (2 dinners & sightseeing-tour included)

TOTAL COSTS BY SITE/ COUTS TOTAUX PAR SITE

SITE	TOTAL COSTS For 5-day Course and the European Dimension Programme (includes housing, meals, local transportation, European Dimension Programme)	COUTS TOTAUX Pour 5 jours de cours et le programme de dimension européenne (logement, nourriture, transport sur place et dimension européenne inclus)
BUDAPEST	***260 EUROS*** **8 days, 8 nights**	***260 EUROS*** **8 jours, 8 nuits**
DELFT	***200-250 EUROS*** **7 days, 8 nights**	***200-250 EUROS*** **7 jours, 8 nuits**
LEUVEN	***230 EUROS*** **8 days, 7 nights**	***230 EUROS*** *8* **jours** , *7* **nuits**
LISBONNE	***162-170 EUROS*** ***8 days, 8 nights***	***162-170 EUROS*** *8* **jours** , *8* **nuits**
LOUVAIN	***291 EUROS*** **8 days, 7 nights**	***291 EUROS*** **8 jours, 7 nuits**
MADRID	***230 EUROS*** **8 days, 8 nights**	***230 EUROS*** **8 jours, 8 nuits**
MILAN	***300-350 Euros*** (depending the above-mentioned dinner offer) **8 days, 7 nights** Transportations not included	***300-350 Euros*** (suivant l'organisation du dînet) **8 days, 7 nights** transport pas compris
COMO	***370 Euros*** **8 days, 7 nights** Maximum Price, could be less	*370 Euros* **8 jours, 7 nuits** **prix maximum, pourrait être moins élevé**
MUNICH	***330 EUROS*** ***8 days, 8 nights***	***330 EUROS*** *8* **jours** , *8* **nuits**
PARIS	***293-307 EUROS*** **8 days, 8 nights** Not included : Transportation from airport	***293-307 EUROS*** **8 jours, 8 nights** pas inclus : transport de l'aéroport
PRAGUE	***220 EUROS*** **8 days, 8 nights**	***220 EUROS*** **8 jours, 8 nights**
TRONDHEIM	***350,50 EUROS*** **8 days, 9 nights**	***350,50 EUROS*** **8 jours, 9 nuits**
VIENNA	***248,50 EUROS*** **8 days, 8 nights**	***248,50 EUROS*** **8 jours, 8 nights**

List of ATHENS Institutions
Liste des institutions ATHENS

BUTE	**BUTE : BUDAPEST : Budapest University of Technology and Economics** H-1111. Budapest, M Egyetem rkp.3 – H-1521 Budapest, Hongary Contact : P. MOSON, Tel : +36 1 463 26 90 – Fax : +36 1-46 31 555 Email : moson@math.bme.hu	Page 64
DELFT	**DELFT : Delft University of Technology** TU DELFT, Julianalaan - 134, 2628 BL.Delft-The Netherlands Contact: G. de GRAAF, R.M.T.C. AGGENBACH & L.J.M. ROTHKRANTZ, Tel : + 31 1 5278 75 04 ; + 31 1 5278 8012 - Fax : +31 1 5278 71 41 ; +31 1 5278 5690 E-mail : G.degraaf@tudelft.nl ; R.M.T.C.Aggenbach@TUDelft.NL; L.J.M.Rothrantz@its.tudelft.nl	Page 64
LEUVEN	**KUL : Katholieke Universiteit Leuven, Faculty of Engineering** Arenbergkasteel, K.Mercierlaan - 94, Belgium-3001 Leuven (Heverlee) Contact : K.BOOGAERTS, Tel : + 32 1 6321748- Fax : +32 1 6321983 E-mail : katleen.boogaerts@ftw.kuleuven.ac.be	Page 65
LOUVAIN	**UCL : Université Catholique de Louvain** UCL Louvain, 3, place du Levant ou 1 Rue Archimede, Belgium 1348 Louvain-la-Neuve Contact : P. MERTES, Tel : + 32 1 0472464- Fax : +32 1 0472466, E-mail : mertes@sfsa.ucl.ac.be	Page 65
LISBOA	**IST : Instituto Superior Técnico Lisboa** IST,GIRE, Av Rovisco Pais, 1,1096 Lisboa Codex, Portugal Contact : Silvia SANTOS, Tel : + 35 121 8417685- Fax : +35121 8419280 E-mail : gire@alfa.ist.utl.pt	Page 66
MADRID	**UPM : Universidad Politecnica de Madrid** UPM, Ramiro de Maeztu 7, 28040 Madrid, Spain Contacts : R.M. BENAVENTE ; I. ARRIBAS, Tel : + 34 9 1 336 6266- Fax : +34 91336 6168/73 E-mails : rm.benavente@upm.es ; iarribas@vi.upm.es	Page 67
MILAN	**MILAN : Politecnico di Milano** Centre for International Relations, Politecnico di Milano, piazza Leonardo da Vinci 32, I 20133 Milano, Italy Contact : Francesca FOGAL Tel : +34 02 2399 2563- Fax : + 39 02 23 99 23 39- Email : studesk2@mail.polimi.it	Page 67
MUNICH	**MUNICH : Technical University of Munich** Lehrstuhl für Baumechanik, Technische Universität München Contact : Professor Gerhard Müller, Karen Arlt, Sekretariat, Arcisstraße 21,D-80333 München Tel : +49 (0)89 289-28345 -fax +49 (0)89 289-28665-Email : karen.arlt@bv.tum.de http://www.bm.bv.tum.de	Page 68

List of ATHENS Institutions continued
Liste des institutions ATHENS suite

PARIS	**ParisTech : Grandes Ecoles d'Ingénieurs de Paris** 46, Rue Barrault, 75634 Paris Cédex 13 Contacts : J. MOLET,-Tel : + 33 1 45 81 75 30- Fax : +33 1 45 81 81 15 E-mails : molet@enst.fr	
PARIS	**ENGREF : Ecole Nationale du Génie Rural des Eaux et des Forêts** 19 Avenue du Maine, 75732 Paris Cédex 15 Contacts : Mme SOUCI, Tel : +33 1 45 49 89 61- Fax : +33 1 45 49 88 27, E-mail : souci@engref.fr C. GOZLER, Tel : +33 1 45 49 89 54- Fax : +33 1 45 49 88 27, Email : qozler@engref.fr	Page 69
	ENPC : Ecole Nationale des Ponts et Chaussées 6 & 8 Av Blaise Pascal, Cité Descartes, Champs/Marne, 77455 Marne la Vallée Cédex 2 J.P. LEONI Tel : + 33 1 64 15 39 44- Fax : +33 1 64 15 39 49 E-mail : jean-pierre.leoni@mail.enpc.fr	Page 69
	ENSAM : Ecole Nationale Supérieure d'Arts et Métiers 151 Boulevard de l'Hôpital, 75013 Paris Contacts : F. MASSOUH Tel : + 33 1 44 24 62 56- Fax : +33 1 42 16 96 16 E-mail : fawaz.massouh@paris.ensam.fr	Page 69
	ENSCP : Ecole Nationale Supérieure de Chimie de Paris 11, rue Pierre & Marie Curie, 75231 Paris Cédex 05 Contacts : N. BAFFIER, Tel : + 33 1 44 27 67 60- Fax : +33 1 43 26 39 72 E-mail : baffier@ext.jussieu.fr J .F.STUYCK TAILLANDIER, Tel : +33 1 44 27 67 35 , Fax : + 33 1 44 07 32 49 E-mail : stuyck@ext .jussieu.fr	Page 70
	ENSMP : Ecole Nationale Supérieure des Mines de Paris 60, boulevard Saint-Michel, 75272 Paris Cédex 06 Contacts : F. SABOT, Tel : + 33 1 40 51 90 81- Fax : +33 1 43 54 18 93 E-mail : sabot@de.ensmp.fr	Page 70
	ENST : Ecole Nationale Supérieure des Telécommunications 46, rue Barrault, 75634 Paris Cédex 13 Contacts : J. MOLET,-Tel : + 33 1 45 81 75 30- Fax : +33 1 45 81 81 15 E-mails : molet@enst.fr	Page 71
	ENSTA : Ecole Nationale Supérieure des Techniques Avancées 32 boulevard Victor, 75739 Paris Cédex 15 Contact : J. NASSAR ; V. LASJUILLIARIAS, Tél : +33 1 45 52 44 24 ; +33 1 45 52 54 76 Fax : +33 1 45 52 54 93 E-mail : naassar@ensta.fr ; lasjuill@ensta.fr@ensta.fr	Page 71

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Liste des institutions ATHENS suite

P A R I S	**ESPCI : Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris** 10, rue Vauquelin, 75231 Paris Cédex 05 Contact : A. JARDY, Tel : + 33 1 40 79 44 16- Fax : +33 1 40 79 47 76 E-mail : alain.jardy@espci.fr P. ROUSSEL, Tel : + 33 1 40 79 44 63- Fax : +33 1 40 79 44 25 E-mail : pierre.roussel@espci.fr	Page 72
	INAPG : Institut National Agronomique de Paris-Grignon 16, rue Claude Bernard, 75231 Paris Cédex 05 Contact : D. CHABOD, Tel : + 33 1 44 08 16 20- Fax : +33 1 40 08 17 00 E-mail : chabod@inapg.inra.fr	Page 72
P R A G U E	**CTU : Czech Technical University in Prague** International Office, Czech Technical University in Prague Zikova 4, CZ - 166 35 Prague 6 Contact : Jan Pozar Tel : +420 2 2435 3465 - Fax: +420 2 2431 1042 E-mail: Pozar@vc.cvut.cz	Page 72
N T N U	**T R O N D H E I M** **NTNU : Norwegian University of Science and Technology** Hogskoleringen 1, 7034 Trondheim, Norvège- Contact : W. LASCHET, Tel : + 47 7 3595240- Fax : +47 7 3595210 - E-mail : international@adm.ntnu.no	Page 73
T U W	**TUW : Vienna University of Technology** Ausseninstitut, Gusshausstrasse 28, 1040 Wien Contact: Andreas Zemann, Tel. +43 1 58801 41552, Fax. +43 1 58801 41599. Zemann@ai.tuwien.ac.at, Web site :www.tuwien.ac.at/ai	Page 74

ATHENS Intensive Courses

Cours de la semaine européenne

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Danube Bridges in Budapest

(BUTE4)

Key words: bridge, Danube, design, erection, reconstruction, aesthetics
Language: English
Institution: Budapest University of Technology and Economics
Professor Responsible: Prof. Dr. Miklós Iványi
Tel: +36 1 463 1825 - **Fax:** +36 1 463 3449 **Email :** steelivanyi@epito.bme.hu, lhegedus@epito.bme.hu
Professor(s) participating in the teaching of the course: Assist. Prof. Dr. László Hegedus, BUTE, Prof. Dr. habil György FARKAS, BUTE
Address where the course will be held: H-1111 Budapest, XI. Bertalan L. U. 2. Hungary
Total number of places: *40/ minimum10*

Course information

Course description :
The students of the BUTE do not need an introduction to the shape, role or importance of steel bridges: the bridges of Budapest offer a unique opportunity for everyone. Constructing bridges requires a wide range of engineering knowledge from foundations and superstructure to the planning of bridge traffic. In this course the subject of steel and iron bridges is presented, summarising the problems of design, detailing, construction, maintenance and refurbishment. This requires a detailed treatment of aspects of both traditional and modern bridges, as modern bridges are to be built and traditional bridges are to be repaired or reconstructed.

Programme to be followed :
Seven 2-hour lectures:
History of Hungarian bridge building
Design, construction, maintenance and refurbishment of the bridges of Budapest
Static problems of bridges in Budapest
Bridge aesthetics
Role of bridges in the development of city construction

Three 2-hour exercises
Using a program from the Internet to design a bridge for given conditions

One-day visit to Budapest bridges (8 hours)

Prerequisites :
General knowledge in Structural Mechanics, use of computer programmes

Course exam :
- Answering test questions
- Evaluation of the bridge made by computer program

Industrial Dispersions

(TUD1)

Key words: Physical Chemistry, Colloids, Emulsions, Dispersions
Language: English (with some support in French)
Institution: Delft University of Technology
Professor Responsible: Dr. ing. G.J.M. Koper - Laboratory of Physical Chemistry, Delft University of Technology, Julianalaan 136, 2628 BL Delft, the Netherlands
Tel: +31 15 278 8218 - **Fax:** +31 15 278 4145 **Email :** g.j.m.koper@tnw.tudelft.nl
Professor(s) participating in the teaching of the course: Lab. staff
Address where the course will be held: Laboratory of Physical Chemistry, Delft University of Technology, Julianalaan 136, 2628 BL Delft, the Netherlands
Total number of places: *10 (minimum 4)*

Course information

Course description :
Introduction to experimental techniques and application of theoretical issues in colloid science, as applied in industry.

Programme to be followed :
The course consists of an extended experiment, lectures and problem solving sessions. The experiment is a "laboratory without assistance", where groups of students design and scale-up a continuous process to prepare sorbent particles for regenerative desulphurisation of off-gas from coal combustion based power plants. The lectures will deal with the relevant physical chemical issues of the experiment as well as related topics. During the problem solving, the students work in small groups on problems related to the experiment.

Five days of experiment, lectures, problem solving sessions and presentation of the results on the final day.

Prerequisites :
Introductory courses in Physical Chemistry and Thermodynamics.

Course exam :
Assessment on the basis of performance during experiments and working classes.

Multi-modal Communication

(TUD2)

Key words: Multi-modal communication, automatic speech recognition, recognition of facial expressions, nonverbal communication, dialogue management.
Language: English
Institution: Delft University of Technology
Professor Responsible: Drs.dr. L.J.M. Rothkrantz
Tel: +31.15.2787504 - **Fax:** +31.15.2787141 **Email :** L.J.M.Rothkrantz@ewi.tudelft.nl
Professor(s) participating in the teaching of the course: Ir. P. Wiggers, ir. D. Datcu, ir. S. Fitrianie
Address where the course will be held: Faculty of Electrical Engineering, Mathematics and Computer Sciences, Mekelweg 4, 2628 CD Delft, The Netherlands
Total number of places: *30-40*

Course information

Course description :
Traditional interfaces of computers are the keyboard and the mouse. A more natural, human like interface is based on voice, touch, gaze and face-input. In the course, an introduction will be presented on Automatic Speech Recognition, the recognition of facial expressions and lip reading. To design a multimodal interface different modalities have to be fused. Fusion of different modalities requires a solution to the ambiguity and a-synchronicity of different signals. To apply the theory, parallel to the course there is a lab assignment. In the lab assignments students will have to build a multimodal interface using the CSLU-toolkit.

Programme to be followed :

Day 1	Introduction to Multimodal Communication
Day 2	Introduction to Automatic Speech Recognition
Day 3	Advanced topics in Automatic Speech Recognition and Applications
Day 4	Automatic Recognition of facial expressions
Day 5	Automatic lip reading

The lectures will given every morning. In the afternoon students will work on their lab assignment.

Prerequisites :
It is assumed that students have a basic knowledge in Signal Processing, Mathematics and Programming.

Course exam :
Students will be asked to write a report about the lab assignment. The report will be discussed and evaluated by a staff member. The last day students will give a presentation on their work. The course will be closed by a presentation of the lab work of the students.
A staff member bases the grade of the course on the report, oral presentation and discussion.

Stepping Twice in the Same River - Integrated Water Management *(TUD3)*

Key words: Water resources, water systems, river basin management
Language: English
Institution: Delft University of Technology
Professor Responsible: ir. M.W. Ertsen
Tel: +31.15.2787423 - **Fax:** +31.15.2785559 **Email :** m.ertsen@citg.tudelft.nl
Professor(s) participating in the teaching of the course: 3
Address where the course will be held: Faculty of Civil Engineering and Geosciences, Stevinweg 1 2628 CN Delft
Total number of places: *15*

Course information

Course description :
Managing water systems in the context of river basins has become an important issue. A river basin is an area in which all the surface water flows to one river mouth, estuary or delta, into the sea through a series/network of streams, rivers and/or lakes. A river basin can be subdivided into a number of sub-basins, but that is not obligatory. Sub-basins are areas of which the water flows through the same river mouth into a larger river. Developing a more integral approach to relate these different levels and human action upon them is necessary, including aspects of water quantity and flooding.

Programme to be followed :
The course develops along two integrated strings of actions:
During 4 morning sessions, groups of 3 to 4 students will work on and discuss case studies (one case per morning). These cases will be selected in order to highlight one or two aspects of water system management (technical, managerial, social, political, etc.) and ways how these aspects relate. Case studies will come from both the Netherlands and other countries, worldwide.
During 4 afternoon sessions the groups of students will work on one dedicated case (different from the one discussed in the morning sessions); for each case, the main research question will be different, but all questions will relate several aspects, theory and practice of water resources management and strategic aspects of planning.

Prerequisites :
Some basic understanding of the hydrological cycle and Fluid Mechanics is required.

Course exam :
Project report.

Light and Lighting

(UCL1)

Key words: Light, lighting, photometry, radiometry, colorimetry, lamps, sensors, rational use of energy
Language: English
Institution: Université Catholique de Louvain
Professor Responsible: C. EUGENE, UCL, Département d'Electricité, Bâtiment Maxwell, B-1348 Louvain-la-Neuve, Belgique
Tel: 0032-10472268 - **Fax:** 0032-10478667 **Email :** eugene@lei.ucl.ac.be
Professor(s) participating in the teaching of the course: Prof. J.J. Embrechts, Université de Liège, Belgique, G. Vandermeersch, Belgian Institute for lighting, and others from industry
Address where the course will be held: UCL, Louvain-la-Neuve. A technical visit is foreseen at the Philips-Turnhout factory. Transfer by coach from Louvain-la-Neuve.
Total number of places: *25 maximum*

Course information

Course description :
Lighting is the technique of production and use of the visible light. Its quantitative evaluation implies an appropriate metrology (the photometry and its corollary the colorimetry). Not only the visual perception of radiation will be considered but also its energetic aspect (radiometry). The professional sector of lighting actually knows a fast increasing due to diverse factors as the prodigious expansion of new lighting sources, techniques of light control, an increasing interest for security and comfort, rational use of energy, European normalisation. One of the course attractions is its multidisciplinary character since it is at the convergence of numerous disciplines as physics, optics, physiology, electricity, electronics, optoelectronics, metrology, informatics. The course aims at a scientific and technologic introduction to this discipline. An engineer approach will be emphasised keeping in mind the constraints linked to the industrial requirements (the research applications in the laboratory are thus not aimed). Furthermore, through the continuous thought it proposes regarding the objects of perception, the courses educates the participant, as it is for the music lover, to "see" our world differently. In this respect, the practical training in the laboratory and the technical visit are essential.
This course is proposed for the sixth consecutive year, but the first time in English (in place of French). It is addressed to every student having a general training in engineering and who is interested to acquire in one week a basic knowledge in this discipline, often little taught in his own institution. A few professionals of the lighting sector will attend this course as refreshing training : their experience on the field will constitute a supplementary richness of the course.

Programme to be followed :
N.B. The course starts on Monday 14 March 2005 at 9:00 h and ends on Friday 19 March at 18:00h
Module 1 : BASICS : Quantities, units, geometrical laws, optical properties of materials, eye and vision, modes of light production, exercises
Module 2 : PHOTOMETRY, RADIOMETRY, COLORIMETRY plus laboratory training
Module 3 : LIGHT SOURCES and LUMINAIRES
Module 4 : APPLICATIONS : interior lighting, public lighting. Exercise on a lighting installation
Module 5 : TECHNICAL VISIT : Philips factory in Turnhout (Belgium) : HID lamps.

Prerequisites :
only a basic training in engineering at the university level is required.

Course exam :
2 steps :
1. Short individual evaluation at the end of the week;
2. Grouped report on the practical laboratory training done during the week, plus answers to additional questions, to deliver at late 2 weeks after the course.

Tunnels and Underground Structures

(UCL2)

Key words: Tunnels, underground structure, soils mechanics, rock mechanics, excavation, modeling
Language: English
Institution: Université Catholique de Louvain
Professor Responsible: Professor Jean-François THIMUS- Civil and environmental Engineering, Place du Levant 1, 1348 Louvain-la-Neuve, Belgium
Tel: +32 10 472122 - **Fax:** +32 10 472179 **Email :** thimus@gce.ucl.ac.be
Professor(s) participating in the teaching of the course: E. JACQUES (Université catholique de Louvain, Department of Mechanic, Belgium);R.M. FAURE (CETU, Centre d'Etude des Tunnels, Lyon, France);A. VANCOTTHEM (Tractebel, Bruxelles, Belgium) & G. BUCHET (Tractebel, Bruxelles, Belgium);D. DE BRUYN (SCK-CEN, Mol, Belgium)Ch. SCHROEDER (Université de Liège, Department of EngineeringGeology, Hydrogeology and Geophysical Prospecting, Belgium)
Address where the course will be held: Auditoires Sainte Barbe, Place Sainte Barbe, 1348 Louvain-la-Neuve
Total number of places: *Total number of places: 30*

Course information

Course description :
To give to the participants a detailed approach of tunnel or underground structure projects. Different aspects will be tackled, as the geology of the site, preliminary soil prospecting, empirical study, analytical and numerical modeling, techniques of excavation and site survey, ventilation and fire security during exploitation. This course will be sustained by theoretical lectures, use of numerical codes, cases histories presentations and the visit of excavated or tunnels in excavation.

The course is given in English and French for a part of the teaching (use of a e-learning on the realization of tunnels).

Programme to be followed :
First day:
Influence of Geology upon the site of the tunnel. Different experimental tests adapted to this problem: site and lab tests, determination of appropriate parameters for the calculation of the underground structure.
Example with cases histories.
Second day:
Empirical studies (limit of utilisation, interest).
Analytical studies.
Numerical modeling (Finite Element Method, Finite Different Method, Distinct Element Block Method).
Example (possibility to use certain codes).
Third day:
Techniques of excavation.
Continuous survey during excavation.
Impact of survey measurements upon excavation.
Example with some case histories.
Fourth day:
Exploitation of the tunnel. Permanent survey. Security. Ventilation aspects. Fire accident.
Example with some recent accidents in Europe (Tunnel du Mont Blanc, _.).
Fifth day:
Visit of a tunnel excavation site (in progress and/or in use).

Prerequisites :
Geology, soil mechanics, rock mechanics, thermodynamics.

Course exam :
Individual project to be presented 2 weeks after the end of the course.

Economic Analysis for Project Management

(UPM1)

Key words: Project management, time value of money, net present value, cash flow analysis
Language: English
Institution: Universidad Politecnica de Madrid
Professor Responsible: June AMILLO
Tel: +34-913-367427 - **Fax:** +34-913-367412 **Email :** amillo@fi.upm.es
Professor(s) participating in the teaching of the course: Rafael GUADALUPE
Address where the course will be held: Facultad de Informática, UPM-Campus de Montegancedo, Boadilla del Monte
Total number of places: *Total number of places: 20, minimum: 6 Of which, Home students: 6 ; Of which, non Home students : 14*

Course information

Course description :
_ Learn to assess the economical worth of a project in real situations considering the price value of money.
_ Understand the different techniques used to compare projects and choose among different alternatives.
_ Work out a series of case studies drawn from real situations.
_ Implement these techniques using software financial functions in a computer lab.

Programme to be followed :
All the sessions will take place in a computer lab. Each session includes:
Presentation of concepts and analysis techniques: 1 hour
Implementation of selected case studies on the computer: 2h. 30m
Discussion: 30m
Students will have to complete assignments on their own for a total of 10 hours.
Contents relative to each day

1. The Time Value of Money
   Interest: Basic Formulas. Cash Flows: Equivalence and Types
   Nominal and Effective Interest rates Analysis of Loans and Bonds
   Effects of Inflation on the Price of Money

2. Present Worth Analysis
   Net Present Value NPV Criteria for a Single Project
   Selecting among Mutually Exclusive Alternatives Capitalized Cost

3. Annual Equivalent Worth Analysis
   AW Criteria .Advantages of the Method. Selecting among Mutually Exclusive Alternatives
   Unit Cost/Profit Calculations

4. Internal Rate of Return Analysis
   Internal Rate of Return: Meaning and Criteria. Simple and Non-simple Projects
   Incremental Analysis. Benefit/Cost Analysis. Projects in the Public Sector
   B/C Ratios. Incremental Analysis

5. Developing Cash Flows
   Cash Flow Elements Effects of Inflation. Depreciation, Taxes and Financing
   Generation and Economic Analysis of a Project Cash Flow.

Prerequisites :
None, but familiarity with Excel would be helpful.

Course exam :
Generate the cash flow of a project and perform an economic analysis

Recent Developments and Prospects in Business Management

(UPM2)

Key words: Management, Strategy, Production, Logistics, Innovation, Marketing, Finance, Capital Markets, Accounting, Globalization, Information Systems, New Economy
Language: English
Institution: Universidad Politecnica de Madrid
Professor Responsible: Carlos RODRÍGUEZ MONROY
Tel: +34-91-336-4265- - **Fax:** +34-91-336-3005 **Email :** :crmonroy@etsii.upm.es
Professor(s) participating in the teaching of the course: Javier CARRASCO, Antonio HIDALGO, Fernando MARÍN, Carlos RODRÍGUEZ-MONROY, Carlos CASANUEVA, Felipe RUIZ and Pablo SOLANA. Departamento de Ingeniería de Organización, Administración de Empresas y Estadística.UPM
Address where the course will be held: José Gutiérrrez Abascal, 2 _ 28006 Madrid, Spain
Total number of places: *24 maximum; 20 Non Home students*

Course information

Course description :
To make the student aware of the evolution, recent developments and perspectives on management. The course will concentrate on business strategy, general management, marketing, production and logistics, technological innovation, corporate finance, capital markets, financial and cost accounting.

Programme to be followed :
1. Business strategy and general management:
Basic concepts and evolution of strategic planning. Competitive strategies: Critical success factors. Core competencies development. Generic strategies. Information and Communication Technologies and competitive strategies. Diversification strategies. Knowledge management. Modern issues in organisation and management. The balanced scorecard. Case studies.

2. Production and logistics:
Evolution and present perspectives of production and logistics management approaches. The logistic system, scope, objectives and management trends. JIT systems, evolution and goals. JIT production systems, management and techniques. JIT supply systems.

3. Innovation:
Technological innovation, concepts and perspectives. Technology transfer from knowledge institutions to industry, concepts and mechanisms. Technology strategy and technological plan. The European innovation system, facts and trends. Case studies.

4. Marketing:
Introduction to marketing and the marketing plan. Frameworks: strategic perspective and marketing mix. New product development and product lyfe-cycle strategies. Specific situations: industrial markets, international markets and entrepreneurial marketing. Case study on Ikea.

5. Finance and Accounting:
Financial and cost accounting, historical perspective. Activity based accounting systems. Cost systems design. Capital markets and corporate finance, historical perspective. Residual income or economic value added (EVA).Shareholder value. Application of option theory to risk management and capital investments (real options).Case study on options: Metallgesellschaft Refining and Marketing .

Prerequisites :
Basic knowledge of a company and of its main functional areas: marketing, production and logistics, accounting and finance.

Course exam :
Class participation, coursework and written exam.

Experimentation For Software Engineering

(UPM12)

Key words: Software Engineering, experiment, empirical validation
Language: English
Institution: Universidad Politecnica de Madrid
Professor Responsible: Sira Vegas
Tel: +34 91 336 6929 - **Fax:** +34 91 336 6917 **Email :** svegas@fi.upm.es
Professor(s) participating in the teaching of the course: _ Natalia Juristo. Languages, Systems and Software Engineering Department.
Address where the course will be held: Facultad de Informática, Campus de Montegarcedo, 28660 Boadilla del Monte, Madrid. Spain
Total number of places: *maximum 25, minimum 10.*

Course information

Course description :

Formal experimentation techniques are not commonly used in software engineering. This fact contrasts with the common practices of other scientific and engineering fields, where it is mandatory to perform a rigorous experimentation that supports the research performed. In this course, the use of experimental design and data analysis techniques is proposed. These techniques establish the theoretical foundations for effectively perform experiments.
This way, the objectives of this course are as follows:

_ That the student understands the importance of empirically validate the techniques used in software development.
_ That the student knows how to apply the different experimentation techniques.
_ That the student o knows some real experiences of experimentation in software engineering.

Programme to be followed :

1.Introduction to Software Engineering Experimentation
- 1.1. Introduction
- 1.2. The Role of Experimentation in Software Engineering
- 1.3. How to Experiment?
- 1.4. Basic Notions of Experimental Design and Data Analysis

2.Kinds of Experimental designs and analysis
- 2.1. One-factor Designs with Two Alternatives
  - 2.1.1. Experimental Design
  - 2.1.2. Data Analysis
  - 2.1.3. Real Experiments Performed
- 2.2. One-Factor Designs and K Alternatives
  - 2.2.1. Experimental Design
  - 2.2.2. Data Analysis
  - 2.2.3. Real Experiments Performed
- 2.3. Experiments with Undesired Variations: Block Designs
  - 2.3.1. Experimental Design
  - 2.3.2. Data Analysis
  - 2.3.3. Real Experiments Performed
- 2.4. Best Alternatives for More than One Variable: Factorial Designs
  - 2.4.1. Experimental Design
  - 2.4.2. Data Analysis
  - 2.4.3. Real Experiments Performed
- 2.5. Non-Parametric Analysis Methods

3.Case Study. An Experiment with Testing Techniques
- 3.1. Basic Software Testing Concepts
- 3.2. Overview of Testing Techniques
- 3.3. An Experiment Comparing the Effectiveness of Testing Techniques
  - 3.3.1. Earlier Experiments
  - 3.3.2. Experiment Goals
  - 3.3.3. Planning the Experiment
  - 3.3.4. Running the Experiment
  - 3.3.5. Data Analysis
  - 3.3.6. Conclusions

- Day 1: Introduction.
- Days 2 and 3: Types oi Experimental Designs and Analysis
- Days 4 and 5. Case Study

Prerequisites :

- A Course on Software Engineering
- A Course on Basic of Statistics.

Course exam :

The students will be evaluated according to the work performed during days 4 and 5 in the Case Study.

Emerging Strategies and Tools in the Marketing Activity

(POLI1)

Key words: Marketing, customers, innovation, shareholders' value, information technology, Internet, Customer Relationship Management
Language: English
Institution: Politecnico di Milano
Professor Responsible: Giuliano Noci
Tel: +39 02 2399 7326 - **Fax:** +39 02 2399 2720 **Email :** giuliano.noci@polimi.it
Professor(s) participating in the teaching of the course: Andrea Boaretto, Ilaria Dalla Pozza and 2 tutors: Chiara Gentile, Nicola Spiller
Address where the course will be held: Politecnico di Milano, Campus Como, Como - Italy
Total number of places: *maximum 30 / minimum 15*

Course information

Course description :
To understand main changes emerging in the marketing activity according to the growing importance of technological innovation and to the key role played by ICTs

Programme to be followed :
The course has been designed to address an audience of students coming from different educational backgrounds. In this perspective, it consists of 4 major parts.
The first attempts to create a common framework about the marketing activity. Hence, it is focuses on the analysis of the process of marketing strategy formation and on marketing levers. Theoretical lectures will be integrated with the discussion of many short case studies.
The second part is devoted to the investigation of the main implications for the marketing activity resulting from the growing importance played by Internet. In this respect, an in depth discussion of the major changes concerning the identification of an effective marketing mix programme will be presented.
The third part of the course focuses on an emerging paradigm in the marketing discipline: Customer Relationship Management. Starting from the identification of the new opportunities offered by technologies of the information society, this module clarifies why and how corporations have to develop long lasting relationships with their key customers.
The final module focuses on the discussion of real life experiences of firms involved in the deployment of new marketing strategies.

Prerequisites :
Some basic notions of Accounting, Strategic planning and Marketing

Course exam :
Answering text questions

Multiple View Geometry and Applications to Computer Vision

(POLI3)

Key words: Geometric transformations, projective geometry, cameras, single and multiple view geometry, reconstructions
Language: English
Institution: Politecnico di Milano
Professor Responsible: Alessandra Cherubini
Tel: +39 02 2399 4575 - **Fax:** +39 02 2399 4621 **Email :** aleche@mate.polimi.it
Professor(s) participating in the teaching of the course: Vincenzo Caglioti, Irene Sabadini, Augusto Sarti, Enrico Schlesinger
Address where the course will be held: Politecnico di Milano, Campus Leonardo, Piazza L. Da Vinci 32, 20133 Milano, Italy
Total number of places: *30/10*

Course information

Course description :
The course aim is to provide the mathematical basis for advanced applications of Computer Vision and Image Understanding and to give examples ofsome of these applications.

Programme to be followed :
The course is mostly based on lectures but it also includes applied interactive sessions (exercises, applications etc.).
The course will be partially based on Chapters 1-14 of Hartley-Zissermann "Multiple-view geometry".
The course will consist of:
An overwiev of geometric transformations such as isometries, similarities, affinities and projectivities. Projective geometry in 2D and 3D. Stratification of projective transformations. Conics.
Single-view geometry: projective cameras, affine cameras. Description of the camera matrix. Computation iof the camera matrix. Camera calibration. Action of a projective camera. Applications and exercises on single view geometry: object localization and recognition, reconstruction from prior knowledge. Estimation and optimization problems. Algorithms.
Two-view geometry: epipolar geometry, fundamental matrix and its properties. Retrieving camera matrices from the fundamental matrix. 3D reconstruction.
Three-view geometry: introduction to the trifocal tensor. Retrieving the fundamental matrix. Estimation and optimization problems. Algorithms and management of outliers. Applications.

Prerequisites :
Mathematical Background: the applicant should master the basics of matrix algebra, geometric transformations, analytic geometry in 2D and 3D

Course exam :
The student will choose whether to take a final exam consisting of a few exercises or to develop a project.

Functional Materials for Biomedica Applications

(POLI4)

Key words: biomaterials, functional graded materials, biological tissues, biomechanics, computational models and numerical methods (concise outlines about FEM, homogeneization, optimisation, identification), experimental models, orthopaedic, dental, cardiovascular prostheses, biomedical devices
Language: English
Institution: Politecnico di Milano
Professor Responsible: Roberto Contro
Tel: +39 02 2399 4328/4208/4257 - **Fax:** +39 02 2399 4220 **Email :** roberto.contro@polimi.it
Professor(s) participating in the teaching of the course: Pasquale vena, Gabriele Dubini + 2 tutors: Dario Gastaldi and Giampaolo Franzoso
Address where the course will be held: Politecnico di Milano, Campus Leonardo, piazza L. Da Vinci 32, 20133 Milano, Italy
Total number of places: *15/5*

Course information

Course description :

During the last decades important benefits for patients affected by pathological or traumatic diseases of orthopaedic, cardiovascular and dental apparatus have been acquired by means of an efficient combinations of devices, designed starting from clinical and surgical suggestions, with materials traditional or innovative, suitably selected considering both bio-and mechanical compatibility. In this course the attention is focused on the role of such materials to outline the main criteria for their selection. As far as the traditional materials their role is underlined considering properties and performances with reference to the physiological environment, their efficiency and reliability of relevant performances. Other materials, unusual or fully innovative are presented emphasizing the same features as above, but also the enormous interest induced by the perspective of much better results and by the speculative and technological novelties exhibited for real and practical purposes and for promising ways towards more and more successful health care treatments.

Programme to be followed :

-State of the art about the prostheses most commonly used, relevant pathologies and anatomic-functional context.
-Outline of the relevant materials, their properties and performances.
-Main criteria of material selection, allowing for different kinds of biocompatibility, efficiency, reliability and durability.
-Some concepts of design, related to the material performances.
-Relevant engineering tools and validation, namely theoretical, computational and experimental models.
-Illustrative examples

Part of the lessons will be given in the rooms of the new Laboratory of Biological Structure Mechanics (LaBS) at the Department of Structural Engineering of Politecnico di Milano, where the philosophy of combining experimental and computational approaches is assumed as base of research and training activities, as it is required by industrial companies and by medical operators everywhere in the advanced world. At the LaBS some numerical simulations will be also tutored.

Prerequisites :

The contents of the course will be presented with a level consistent with starting from phenomenological descriptions of the anatomic and physiological contexts and related clinical, surgical motivations and applications until concepts of modelling and experimentations. The level of a more close, personal investigation, that is encouraged and will be tutored, will depend on the interest of the students and on their preparation. To optimise these goals an engineering culture should be preferable because basic notions of physics, chemistry and mechanics might be given as principle already acquired. However a strong interest towards the topics dealt with in the course might be a good motivation to fill part of the cultural lacks of a candidate, provided that fluid and solid mechanics, at least at basic level, be considered as essential requirements to understand the real meaning of the topics dealt with and to appreciate their value in opening the mind to the new frontiers of the bioengineering.

Course exam :

The oral exam will concern all the topics delivered, among which some topics selected by each student and agreed on with the teacher will be more closely examined. Such a topic might be the subject of a written report.

Theory of Reliability with Application to Structures

(TUM1)

Key words:
Language: English
Institution: Technische Universität München
Professor Responsible: Univ.-Prof. Dr.-Ing. Gerhard MÜLLER, Technical University of Munich
Tel: +49 89 289 28348 - **Fax:** +49 89 289 28665 **Email :** gerhard.mueller@bv.tum.de
Professor(s) participating in the teaching of the course:
Address where the course will be held: Technical University Munich
Total number of places: *20, minimum 10*

Course information

Course description :
Introduction to risk and safety
Assessment of risk
Elementary probability concepts, distributions, estimation of parameters
Reliability analysis methods
Assessment of the reliability of mechanical systems
Practical approach in the codes of civil engineering, target reliabilities, quality assurance

Programme to be followed :
Programme t.b.f.: Visit of labs for material testing

Prerequisites :
-good level in engineering mechanics with a certain enthusiasm also for mathematics
-good level in spoken and written English

Course exam :
Examination at the end of the course.
Active participation in the course.

Crashworthiness, Metal Forming and NVH (noise, vibration, harshness)

(TUM2)

Key words: Computational Mechanics, Crashworthiness, Metal Forming
Language: English
Institution: Technische Universität München
Professor Responsible: Dr.-Ing. habil. Fabian DUDDECK, BMW Group and Technical University of Munich
Tel: +49 89 382 29213 - **Fax:** +49 89 382 42820 **Email :** fabian.duddeck@bmw.de
Professor(s) participating in the teaching of the course: Marcus Wagner (BMW)
Address where the course will be held: Technical University Munich
Total number of places: *20, minimum 10*

Course information

Course description :
-Numerical methods for crash analysis, their possibilities and actual deficiencies
-Numerical modeling of NVH (noise, vibration and harshness); problems for statics, dynamics and acoustics of car bodies
-Numerical modeling of metal forming processes (Basic phenomena, simulations, software, material models)
-New numerical methods for crash, metal forming and NVH (e.g. meshless methods, evolutionary optimization etc.)
-New materials for virtual car prototyping
-Validation of numerical results

Programme to be followed :
Context of crash, metal forming and structural dynamics:
-History of car design and its numerical methods
-Influences of laws and market on virtual car design
-Actual an upcoming international requirements on virtual car design
-Capability and deficiency of numerical methods for the design of cars
-Aspects of risk and safety philosophy
-Experimental validation of virtual design

Methodological aspects:
-Finite element methods
-Particular element formulations for simulations in automotive engineering
-Dynamics of structure, eigen modes and frequency analysis
-Finte element models for physical and geometrical non-linear phenomena
-Meshless methods: smooth particle hydro-dynamics and finite point method
-Optimization

Practical aspects of car body design:
-Statics and dynamics
-Acoustics and harshness
-Standard high speed crash diciplines
-Low speed crach
-Pedestrian protection, Air bags, dummies, barriers
-Metal forming

Prerequisites :
-good level in engineering mechanics and mathematics
-Basic knowledge of finite element methods
-Good level in spoken and written English

Course exam :
Examination at the end of the course.
Active participation in the course.

Application of Glass in Structural Engineering

(TUM3)

Key words: Application of glass, structural engineering, glass building material
Language: English
Institution: Technische Universität München
Professor Responsible: Univ.-Prof. Dr.-Ing. Geralt SIEBERT, University of the armed forces Munich
Tel: +49 89 6004 2521 - **Fax:** +49 89 6004 2507 **Email :** geralt.siebert@unibw-muenchen.de
Professor(s) participating in the teaching of the course: Dipl.-Ing. Iris Maniatis Technical University of Munich
Address where the course will be held: Technical University Munich
Total number of places: *20, minimum 10*

Course information

Course description :
Introduction:Glas as building material for load bearing structural elements (Temered glass types, laminated glass, manufacturing and special behaviour)
-Requirements for glass structures given by building authority
-Design of structurtal elements made of glass:
-Actual technical rules / standards
-Design based on fracture mechanics and modern safety concept
-Future rules / standards /DIN, DIN EN, ...)

Calculation and modeling of glass elements
-Linear bearing - Point fixed glazing
-Simple methods - FEA
-Special problems in FEA modeling

Programme to be followed :
-Testing in laboratory - why? Examples
-Examples of realised projects
-Excursion to realised projects (e.g. Herz-Jesu Kirche)

Prerequisites :
-good level in engineering mechanics
-Basics knowledge in archtecture
-good level in spoken and written English

Course exam :
Examination at the end of the course.
Active participationinthe course.

Durability of Polymers and Composites

(ENSAM1)

Key words: Polymers, ageing, life time
Language: English
Institution: Ecole Nationale Supérieure d'Arts et Métiers
Professor Responsible: Tcharkhtchi A.
Tel: 01 44 24 63 01 - **Fax:** 01 44 24 63 82 **Email :** abbas.tcharkhtchi@paris.ensam.fr
Professor(s) participating in the teaching of the course:
Address where the course will be held: 151 bld de l'Hôpital 75013 Paris
Total number of places: *25*

Course information

Course description :
Manufacturers and users of parts based on polymer, filled polymer or composite are often confronted with problems of prediction of their life time. This aspect which is a strongly multidisciplinary matter, is not studied enough in the field of polymer science in universities.
In this field, the main question is what is the consequence of ageing on properties of polymeric parts, after processing and during their use. For finding the answer, one needs to know about aging mechanisms and kinetics to predict the life time of polymers by different models.

Programme to be followed :
During this course different aspects will be developed :
- basic knowledge of polymers and composites
    - architectures of molecular chains
    - different physical states
    - morphology....
- properties of polymers and composites
- ageing in its different forms
- physical ageing
- chemical ageing
- analytical methods for study of ageing
    - differential scanning calorimetrics
    - infra-red spectrometry
    - thermo-mechanical analysis
    - rheometry...
- ageing kinetics
- effect of ageing on properties of materials
    - physical properties
    - mechanical properties
- study of ageing during processing
    - extrusion
    - rotational moulding

Prerequisites :
The course is, indeed, an initiation to ageing of polymeric materials for students who know a little about materials and the mechanics of materials.

Course exam :
The students will present a short report on selected topics of the course at the end of programme.

Knowledge Management

(ENSAM2)

Key words: knowledge management, competencies, intellectual capital, innovation, Communities of Practice
Language: English/French
Institution: Ecole Nationale Supérieure d'Arts et Métiers
Professor Responsible: Marc de Fouchecour
Tel: +33 1 44 24 64 59 - **Fax:** + 33 1 44 24 62 70 **Email :** marc.fouchecour@paris.ensam.fr
Professor(s) participating in the teaching of the course: T. Baker (Gemplus); J-F Ballay (EDF); J-M Blancherie (I-KM); P. Bresse (Cabinet B&M); R.D. Collins (I-KM), J. SANTOS (INSEAD).
Address where the course will be held: ENSAM, 151, boulevard de l'Hôpital 75013 PARIS
Total number of places: *32,12*

Course information

Course description :
Knowledge and individual and collective competence are today recognised as the principal sources of competition and innovation within companies. The management of a company's intangible resources, or intellectual capital, constitutes an economic, organisational and human challenge.
The objective of this course is to present the necessary concepts and methods for a successful approach in Knowledge Management. Use will be made of the strong contribution made by information technologies and emphasis will be placed on Communities of Practice (CoPs) which are one of the most important factors of success in the Knowledge Management Approach.

Programme to be followed :
The themes which will be treated are in particular :
- to what challenge does knowledge management reply?
- fundamental aspects of knowledge management
- knowledge management methodologies
- practising communities
- conducting a knowledge management software tools and community-oriented technologies
- intellectual capital
- management of competence
- technology intelligence
- knowledge management and e-learning
- knowledge management and innovation

Pedagogical approach:
- lectures by experts in the area
- talks and panel discussions with professionals who have successfully managed knowledge management projects
- team group sessions on case studies
- presentation and use of software tools

Prerequisites :

Course exam :
3 criteria will be used:
- participation on exercises completed during the course and on documents presented
- active participation in group work
- a written examination

Natural Language Processing in Prolog

(ENST3)

Key words: : NLP, language, logic programming
Language: English
Institution: Ecole Nationale Supérieure des Telécommunications
Professor Responsible: Jean-Louis Dessalles & François Yvon
Tel: +33 1 45 81 75 29 - **Fax:** +33 1 45 81 31 19 **Email :** dessalles@enst.fr
Professor(s) participating in the teaching of the course: Jean-Louis Dessalles,François Yvon
Address where the course will be held: École Nationale Supérieure des Télécommunications _ 46 rue Barrault - 75013 Paris - France
Total number of places: *24, minimum 8*

Course information

Course description :
The objective is to give students a good understanding of the challenges offered by natural language processing (NLP), and to provide a set of technical tools to approach them.

We chose to favour a logico-symbolic description of the various levels of language representation, from lexical form to semantics, including morphology and syntax.

The course includes an initiation to Prolog, a logic-oriented programming language widely used in Artificial Intelligence. This computer language will be consistently used for NLP practical work.

Students will be asked to write a simple grammar of English or of their mother language. This grammar will be augmented by a semantic layer, so that the program will be able to understand simple sentences and make correct inferences.

Programme to be followed :
Course: First steps in Prolog - Recursion - Unification - Backtracking
Computer Work: Simple exercises in Prolog -
Course: Declarative Programming - Aumatons, knowledge representation,problem solving
Computer Work: Problem solving in Prolog -
Course: Definite Clause Grammar - Chart parsing -
Computer Work: Writing a small natural language parser -
Course: Some syntactic mechanisms - Simple tools for syntactic processing
Computer Work: Some methods for processing meaning -
Course: Writing a small grammar of one's mother language -
Computer Work: Semantic processing in a very small world -

Prerequisites :
Students should be fluent in some programming language. Moreover, a good practice of a recursive language (LISP, Camel, _) would considerably ease the student_s first steps.

Course exam :
Students will have to solve a few exercises in Prolog, and their computer work will be evaluated.

An Overview in Information & Communication Technology Security

(ENST4)

Key words: Threats, Vulnerability, Security, Protection, Information Technology architecture, cryptography, cryptographic protocols, watermarking, public key infrastructure, wireless network security, Internet security, biometry, protection of critical infrastructure.
Language: English
Institution: Ecole Nationale Supérieure des Telécommunications
Professor Responsible: Michel RIGUIDEL
Tel: + 33 1 45 81 73 02 / 78 30 - **Fax:** + 33 1 45 81 31 19 **Email :** riguidel@enst.fr
Professor(s) participating in the teaching of the course: Michel Riguidel
Address where the course will be held: ENST - 46, rue Barrault - 75634 Paris Cedex 13 _ France
Total number of places: *50, minimum 20*

Course information

Course description :
To obtain a good overview in digital security in the perspective of the convergence between Telecom, Information Technology and Multimedia and to understand the trends in security.
The course provides a global overview of modern security issues in communication networks. It presents a prospective viewpoint of Internet and mobile wireless security, and gives many starting points to research on. The course describes the limitations of current communication security in the rising multimedia communication age, the need for more complex/subtle security mechanisms and policies. The course provides a short description of new security paradigms with the emergence of the ambient intelligence concept and new architectures (P2P, Grids, Virtual entities _). The new environment (_always connected', nomadic users, mobile infrastructures, heterogeneity _) and the pregnant morphology of information systems require a drastic change of our static vision of rules for security policies to be enforced, implemented and verified. The course will address new aspects of protection and security functions required for users, in a private infosphere (virtual identity, authentication with time and space, anonymity, non-observability, digital rights management, biometry), in a networked infosphere (virtual private networks, new firewalls, inter-network security), and in an open public infosphere.
The course will discuss emerging vulnerabilities and outlines a systemic approach to security aimed at protecting critical infrastructures and attenuating the risk of inter-infrastructure cascade effects in the event of serious accident or cyber-attack. Finally, the course gives an overview of possible future developments and research areas that need to be explored to provide security in the future communication networks.

Programme to be followed :
5 days on security
the security issues for the next ten years in an open world (Internet and mobile networks)
threats, vulnerabilities
security models, security functions
cryptography (DES, AES, RSA, cryptographic protocols, SET, SSL, etc)
steganography (watermarking)
trusted infrastructures (X509, public key infrastructures)
biometry, viruses, firewall
Common Criteria methodology
Perspectives of research (privacy, quantum networks, etc)

Prerequisites :
MINIMUM FOR THE COURSE: A good undergraduate level in Computer Science and Networks.General Knowledge in Telecoms and Computer Science are required.Notions in mobile networks, Internet (IP, _), distributed systems are prerequisite.

Course exam :
Exercises on aspects presented during the course.

Non Destructive Evaluation and Characterisation of Materials

(ESPCI1)

Key words: Non destructive evaluation, X-ray radiography, ultrasonic inspection, thermography - optical methods
Language: English/French
Institution: Ecole Supérieure de Physique et de Chimie Industrielles de Paris
Professor Responsible: Dominique BONNIN
Tel: +33 1 40 79 46 24 - **Fax:** +33 1 40 79 47 44 **Email :** dominique.bonnin@espci.fr
Professor(s) participating in the teaching of the course: Dominique BONNIN, Thierry DITCHI, Jean-Claude CHARMET, Daniel ROYER, Mathias FINK, Christian FRETIGNY, Michel BARQUIN, Gérard DREYFUS
Address where the course will be held: ESPCI 10 rue Vauquelin 75005 PARIS
Total number of places: *15 , 5 minimum*

Course information

Course description :
This five day course includes 15 hours of lectures and 16 hours of experimental laboratory work and/or visits of different laboratories of ESPCI and companies which are involved in non destructive evaluation.
Non-destructive evaluation has been developed both to achieve zero defect conditions in the fabrication of products as well as for surveillance during operation. The methods which are used are extremely varied, and call upon many different disciplines in physics and material science. Their sophistication has become more and more extended in order to meet ever rising demands of industry and research. This course is an introduction to the techniques used for non-destructive evaluation, and is focused on the most used.

Programme to be followed :
-Industrial and medical use of X-Rays.
-Ultrasonics : transducers - principle of time reversal method - generation and optical detection and examples of applications.
-Infrared radiometry, passive and active.
-Charge control in dielectric materials.
-CND on a microscopic scale : atomic force microscopy or AFM.
-Optical control techniques : holography and moirés.
-Adherence.
-Application to neural networks for NDE signal processing.
-Visits of industrial laboratories (2 days) ONERA, ALCATEL etc.

Prerequisites :
For Physicists and Material Science students ; elementary notions of Electromagnetism, Acoustics and Optics are necessary.

Course exam :
Evaluation will be made on the basis of a twenty minute oral presentation of one of the techniques studied during the laboratory portion of the course.

Structure-Property Relationships in Polymers

(ESPCI2)

Key words: Polymers, chemistry, chemical physics, mechanics, rheology
Language: English/French
Institution: Ecole Supérieure de Physique et de Chimie Industrielles de Paris
Professor Responsible: Professor Jean Louis Halary
Tel: 33 (0)1 40 79 47 86 - **Fax:** 33 (0)1 40 79 46 86 **Email :** Jean-louis.halary@espci.fr
Professor(s) participating in the teaching of the course: University Professors and Senior Researchers from CNRS and Companies
Address where the course will be held: ESPCI, 10 rue Vauqeulin 75005 PARIS
Total number of places: *From 8 (minimum for opening) to 25*

Course information

Course description :
A huge variety of polymeric materials are widely used to satisfy both usual needs of every day_s life and sophisticated applications in aerospace industries, medicine, microelectronics, optics, etc. This course would aim: i) to rank the materials in different families according to their chemical structure and architecture, ii) to provide an understanding of their macroscopic properties thanks to suitable structure- property relationships, and iii) to suggest some predictions for the design of new materials.

Programme to be followed :
a)two introductory 3-hour lectures (background on polymer morphology and chain mobility characteristics) in the case of amorphous and semi-crystalline thermoplastics ;
b)five specialized 3-hour lectures on:
- thermosetting polymers,
- vulcanized rubbers and thermoplastic elastomers,
- organic / inorganic hybrids and nanocomposites,
- adhesives,
- _smart_ polymers and gels;

c)a round-table conference on the polymer R & D activities in a Multinational Company ;
d)the visit of an industrial site in Paris suburbs ;
e)a concluding exam session, based on short presentations given by the students on selected case studies.

Prerequisites :
No extensive background in macromolecular science is required. General ideas in the fields of polymer chemistry, chemical physics, mechanics and rheology are welcome, together with great inquisitiveness of mind.

Course exam :
exam session, based on short presentations given by the students on selected case studies.

Le langage C++

(MP01)

Key words: Langage orienté objet, typage, héritage, généricité, contrôle d'accès, mécanisme d'exception, gestion de la mémoire, bibliothèque de programmes - STL, introspection
Language: French
Institution: Ecole Nationale Supérieure des Mines de Paris
Professor Responsible: Valérie Roy, Centre de mathématiques appliquées, ENSMP
Tel: 33 4 92 38 79 46 - **Fax:** 33 4 93 65 43 04 **Email :** valerie.roy@cma.inria.fr - Site du cours : http://www.cma.ensmp.fr/cma/enseignement/ingenieur_civil/athens/cplusplus/view
Professor(s) participating in the teaching of the course: Valérie Roy, CMA, cours et travaux pratiques, Loïc Joly, ingénieur au Centre Technique de Simulation de Renault
Address where the course will be held: 2004 route des Lucioles - 06902 Sophia-Antipolis Cedex - le cours se déroule à Sophia-Antipolis (dans le sud de la France à 950 km de Paris près de Nice) ; les étudiants sont logés à Antibes près de la vieille ville et des réseaux de transport
Total number of places: *10, minimum : 5*

Course information

Course description :
C++ est devenu le langage industriel normalisé incontournable. En effet, il combine les grandes qualités des langages de haut niveau orientés objets à la puissance des langages proches de la machine. Comme toutes les applications comportent des contraintes de temps d'exécution et d'espace mémoire, il permet l'implémentation des logiciels qui nécessitent une manipulation directe des cibles matérielles (systèmes d'exploitation, drivers de périphériques, réseaux, ...) tout en apportant l'expressivité, la réutilisation, la maintenance, la simplicité d'évolution, la facilité de test, la gestion de gros projets, le passage à l'échelle, la stabilité des codes écrits et la portabilité.
C++ est un langage généraliste à large spectre. Ayant été intensivement utilisé dans de nombreux domaines, il devient désormais possible de l'utiliser efficacement dans les applications qui imbriquent une grande variété de disciplines : réseau, calcul numérique, applications graphiques, interfaces utilisateur, etc. C++ est un des langages de référence des logiciels libres Open Source.
C++ est un des principaux langages utilisés dans le monde industriel et dont la connaissance est indispensable à tout futur ingénieur désireux de s'impliquer dans les nombreux domaines connexes aux technologies de l'information et de la communication.

Programme to be followed :
Dans le cours nous aborderons exhaustivement toutes les constructions du langage. Lors de travaux pratiques, l'accent est mis sur l'apprentissage du langage lui même, en dehors d'environnement de programmation intégré, afin que les mécanismes de compilation, d'édition de liens, de déboguage et d'exécution soient bien compris. Nous ferons également une démonstration d'un environnement de programmation intégré afin d'en montrer les spécificités et les différences.
Le petit nombre d'élèves de ce cours, nous permet de l'adapter au niveau de chacun autant lors des présentations que lors des séances de travaux pratiques en proposant des exercices de différentes difficultés.
Un conférencier industriel, ingénieur chez Renault, ayant choisi C++ pour la programmation d'applications de tailles importantes, illustrera ce cours. Il décrira la manière industrielle de concevoir, de gérer en équipe et de faire évoluer de grandes quantités de code C++.

Contenu
- la réutilisabilité et la généricité (pour réduire les coûts de développement : mécanismes orientés objets, classes template) ;
-le contrôle d'accès (séparation de la spécification et de l'implémentation) ;
- le typage fort et le polymorphisme (pour détecter les erreurs le plus tôt possible dans le cycle de développement : structures et classes, dérivation simple et multiple, surcharge des fonctions et des opérateurs, etc.) ;
- les mécanismes d'exceptions pour la gestion des erreurs à l'exécution ;
- la gestion de la mémoire (mémoire statique, pile d'exécution, mémoire dynamique, surcharge des opérateurs d'allocation et de désallocation) ;
- l'introspection sur les types de données lors de l'exécution ;
- l'utilisation de la STL, bibliothèque normalisée de classes et de fonctions C++.

Support de cours
Copie des transparents.

Prerequisites :
Notions légères de programmation et d'informatique.

Course exam :
Projet de programmation.

Energies alternatives : de l'expérimentation à la simulation

(MP02)

Key words: Énergétique, expérimentation, simulation numérique
Language: French
Institution: Ecole Nationale Supérieure des Mines de Paris
Professor Responsible: François-Pascal NEIRAC, Centre d'Energétique, ENSMP
Tel: 33 1 4 93 95 74 08 - **Fax:** 33 1 4 93 65 43 04 **Email :** francois.neirac@cenerg.cma.fr
Professor(s) participating in the teaching of the course: François-Pascal NEIRAC, Centre d'Energétique, ENSMP
Address where the course will be held: Rue Claude Daunesse, 06904 Sophia-Antipolis Cedex - le cours se déroule à Sophia-Antipolis (dans le sud de la France à 950 km de Paris près de Nice) ; les étudiants sont logés à Antibes près de la vieille ville et des réseaux de transport
Total number of places: *10, minimum : 2*

Course information

Course description :
Energies renouvelables, hydrogène, stockage, production répartie d'électricité, _ : l'énergie du futur fera largement appel à tous ces systèmes qui sont aujourd'hui en germe dans les laboratoires. Il est proposé aux élèves de les découvrir en suivant la démarche de l'ingénieur de recherche

Programme to be followed :
Le travail se fait par binômes ou trinômes. Chaque groupe traite un sujet différent et utilise au cours de la semaine l'un des bancs d'essais du Centre d'Énergétique à Sophia-Antipolis, en parallèle avec une plate-forme de simulation. Il lui est demandé :

- d'appréhender un problème physique particulier, de réfléchir à la façon dont il peut être résolu au travers d'une formulation abstraite (mise en équation) ;

- d'identifier les paramètres qui, dans le problème posé, doivent faire l'objet d'une détermination expérimentale ;

- de mettre au point et de mener à bien les expérimentations nécessaires ;
- d'utiliser les résultats expérimentaux pour résoudre le problème posé, en utilisant un environnement de simulation numérique.

L'enseignement fait largement appel à l'esprit d'initiative des élèves, tant au niveau de la conception du dispositif expérimental, qu'à celui du traitement et de l'exploitation des données, ils doivent imaginer et mettre en _uvre des solutions en s'appuyant sur leur savoir faire d'ingénieur généraliste.

Sujets traités : modélisation d'un champ photovoltaïque, boucle de test pour capteurs solaires thermiques, pile à combustible, production d'hydrogène par micro reformeur plasma embarqué.

Prerequisites :
Aucun pré-requis particulier n'est demandé. Une connaissance de l'environnement MATHLAB/SIMULINK est souhaitable, mais non nécessaire.

Course exam :
Le travail est noté par chacun des encadrants, en fonction de la qualité du travail effectué durant la semaine et de celle de la présentation orale finale.

Europe utile : une approche industrielle

(MP03)

Key words: Union Européenne, Europe, Marché Commun, Marché Unique
Language: French
Institution: Ecole Nationale Supérieure des Mines de Paris
Professor Responsible: Gérard FOUILLOUX, Ancien délégué pour les affaires européennes, SNECMA, Bruxelles
Tel: 33 1 40 51 90 81 - **Fax:** 33 1 43 54 18 93 **Email :** francoise.sabot@ensmp.fr
Professor(s) participating in the teaching of the course: Nombreux spécialistes des affaires européennes
Address where the course will be held: 60, boulevard Saint-Michel - 75272 Paris Cedex 06- 1 journée à Bruxelles (frais de transport s'élèvant à environ 70 ?)
Total number of places: *40, minimum : 15*

Course information

Course description :
Faire connaître aux élèves les processus de prise de décisions dans l'Union Européenne d'une façon générale d'abord, puis, en orientant exposés et interventions délibérément vers des besoins des entreprises.
Présenter les activités de grands groupes français et étrangers face aux opportunités et enjeux ouverts par le développement de l'Union Européenne.

Programme to be followed :
Des modules successifs et cohérents :

- Immersion dans l'UE à Bruxelles : Visites de la Commission, du Parlement Européen, de la Représentation Permanente de la France.

- Le labyrinthe communautaire : comprendre pour agir - aspects institutionnels .

- Les politiques génériques :
concurrence, recherche, innovation, marché unique, commerce, environnement, société de l'information .

- Le lobbying .

- Synthèse et conclusion politique.

Ce module a bénéficié d'une subvention octroyée par la Commission Européenne dans le cadre de l'Action Jean Monnet "Module Européen"

Prerequisites :
Aucune connaissance spécialisée particulière

Course exam :
Examen écrit : QCM, le vendredi 18 mars 2005.

Gestion et évaluation des risques

(MP04)

Key words: Risque technologique majeur, gestion de crise, évaluation des risques, prévention des risques, administration
Language: French
Institution: Ecole Nationale Supérieure des Mines de Paris
Professor Responsible: Franck HUIBAN, Responsable de la formation des corps techniques de l'État, ENSMP
Tel: 33 1 40 51 90 22 - **Fax:** 33 1 40 51 92 87 **Email :** franck.huiban@ensmp.fr
Professor(s) participating in the teaching of the course: Franck HUIBAN et Patrick LAGADEC, Laboratoire d'Econométrie, École Polytechnique
Address where the course will be held: 60, boulevard St Michel - 75272 Paris Cedex 06 et une journée de visites sur le terrain (en Ile-de-France ou région limitrophe) ; les frais de transport s'élèvent à environ 40 euros
Total number of places: *40 (y compris les 18 ingénieurs-élèves suivant la formation des corps techniques de l'État)*

Course information

Course description :
Les sociétés modernes sont confrontées aux problèmes de la maîtrise des risques technologiques majeurs. D'origine industrielle, nucléaire ou autre, les défaillances peuvent déstabiliser une activité économique ou mettre en état de choc la société toute entière. Un approfondissement sera porté sur :
-la prévention : conception de systèmes dont les défaillances sont les moins graves et les moins fréquentes possibles,
-la préparation du terrain humain à une meilleure cohésion, à une bonne connaissance des responsables concernés et à la mise au point de plans d'intervention adaptés et opérationnels,
-la gestion des crises en temps réel,
- la relecture critique des crises permettant d'améliorer les trois niveaux précédents

Programme to be followed :
Le programme de l'enseignement est réparti entre des conférences des acteurs publics et privés concernés par les risques technologiques (administrations, entreprises, associations), des études de cas et des visites industrielles.

Il aborde notamment :
- l'analyse des risques technologiques majeurs,
- la prévention des risques chimique et nucléaire,
- le rôle des administrations techniques concernées (ministère chargé de l'environnement, autorité de sûreté nucléaire, _),
- la gestion de crise (définition, simulation de crises...).

Prerequisites :
Aucune connaissance spécialisée particulière

Course exam :
Conditions du contrôle des connaissances
Examen écrit. : le 18 mars 2005

Mechanics of Inelastic Structures

(MP06)

Key words: Structural analysis , constitutice equations, plasticity
Language: English
Institution: Ecole Nationale Supérieure des Mines de Paris
Professor Responsible: Jacques BESSON,Centre des Matériaux, ENSMP
Tel: 33 1 60 76 30 37 - **Fax:** 33 1 60 76 31 50 **Email :** Jacques.Besson@mat.ensmp.fr
Professor(s) participating in the teaching of the course: G CAILLETAUD, S. FOREST, Centre des Matériaux, ENSMP, F. FEYEL,ONERA
Address where the course will be held: 60, boulevard Saint-Michel, 75272 Paris cedex 06
Total number of places: *20, minimum : 6*

Course information

Course description :
Structural analysis accounting for non-linearities related to the material behavior is increasingly used in the design of advanced engineering components. This is the case for high temperature turbines for both terrestrial or aerospace applications, for the safety assessment of nuclear pressure vessels or of
aircraft fuselages. New fields of application such as biomechanics or microelectronics are
also emerging.
The purpose of this course is to introduce material constitutive equations used to represent non linearities such as plasticity, creep, kinematic hardening, damagetogether with the appropriate numerical methods (integration methods of constitutive equations, non-linear finite element solvers...) used to perform non-linear structural analyses. The course consists in main lectures and practical case studies.

Programme to be followed :
Programme

Plasticity and viscoplasticity. Finite strains. Non linear finite element solvers. Integration of constitutive equations. Simplified methods for metal forming. Limit analysis.

Prerequisites :
A good level in Continuum Mechanics and notions of the theory of the plasticity of solids

Course exam :
A project carried out on the Sun Network of the ENSMP during the week. Students will have an additional week for writing up their work. The final evaluation will be based on both the written document and the realisation of a Web page. Examples of subjects already dealt with by students can be found on : http://www.mat.ensmp.fr/Produits/Zebulon/Exemples/index.html

Écologie et environnement

(MP07)

Key words: Écologie générale, environnement
Language: French
Institution: Ecole Nationale Supérieure des Mines de Paris
Professor Responsible: Michel POULIN, Centre d'informatique géologique, ENSMP
Tel: 33 1 64 69 47 48 - **Fax:** 33 1 64 69 47 13 **Email :** michel.poulin@ensmp.fr
Professor(s) participating in the teaching of the course: Michel POULIN et Bernard SOULARD, Direction départementale de l'agriculture et de la forêt du Morbihan, Vannes
Address where the course will be held: 60, boulevard Saint-Michel, 75272 Paris Cedex 06, du 14 au 17 mars 2005 et stage de terrain en Bretagne du vendredi 18 au samedi 19 mars. Conditions spécifiques : les frais de transport et de séjour s'élèvent à environ 100 euros
Total number of places: *40, minimum : 15*

Course information

Course description :
Cet enseignement a pour but de faire comprendre comment les activités sociales sont susceptibles de modifier la structure et le fonctionnement des écosystèmes. Il doit conduire l'élève à considérer l'ensemble des impératifs liés à la gestion du milieu naturel comme un facteur supplémentaire à prendre en compte dans toute décision de nature industrielle (ou autre) : il vient se conjuguer aux objectifs économiques, aux contraintes sociales et juridiques, etc..., et contribuer à donner à ces problèmes un éclairage original.

Programme to be followed :
L'objectif du programme est double :

-découvrir et comprendre les principaux processus physiques, chimiques et biologiques se déroulant dans les milieux naturels ;

- prendre conscience sur des cas concrets de l'impact des technologies sur l'environnement et identifier cet impact.

Pour ce faire, un enseignement magistral est consacré aux fondements de l'écologie générale, à une initiation au droit et à l'économie de l'environnement, et à divers sujets tels que l'environnement atmosphérique, la modélisation des écosystèmes aquatiques et/ou la gestion des déchets.

Un stage et des visites de terrain sont consacrés à l'observation et à l'étude des différents écosystèmes, des perturbations anthropiques qu'ils subissent et des installations correctrices mises en _uvre (stations de traitement et d'épuration, stockage de déchets, etc...).

Prerequisites :
Aucune connaissance particulière, mais une formation ou un intérêt pour les sciences de la nature peuvent être appréciables.

Course exam :
Rapport de stage et examen écrit individuel.

Géochimie pour l'ingénieur : de la cosmochimie à la qualité des eaux

(MP08)

Key words: Géochimie, hydrochimie, environnement, qualité des eaux, modélisation
Language: French
Institution: Ecole Nationale Supérieure des Mines de Paris
Professor Responsible: Jean-Michel Schmitt, Centre d'Informatique Géologique, ENSMP
Tel: 33 1 64 69 49 22 - **Fax:** 33 1 64 69 47 03 **Email :** schmitt@cig.ensmp.fr
Professor(s) participating in the teaching of the course: Jean-Michel Schmitt, Louis Raimbault, Laurent De Windt , Centre d'Informatique Géologique, ENSMP
Address where the course will be held: lundi 14 mars : 60, boulevard Saint-Michel, 75272 Paris cedex 06 et du 15 au 18 mars : 35 rue Saint-Honoré, 77305 Fontainebleau - Transport Paris-Fontainebleau par navette de l'Ecole chaque jour
Total number of places: *24, minimum : 10*

Course information

Course description :
Les problèmes liés à la qualité des ressources en eau représentent un des enjeux majeurs du siècle présent. Cet enseignement a pour but d'introduire les principes de la géochimie, puis de les appliquer à des cas réels selon une démarche intégrant conceptualisation, modélisation, application industrielle. Ceci amènera l'élève à s'intéresser aux différents états de la matière dans le milieu naturel et à réfléchir sur des cas pratiques tels que gisements miniers, pollution d'aquifères, réhabilitation de sites pollués, ou gestion des déchets.

Programme to be followed :
Le cours est scindé en deux troncs, le premier d'introduction, le second d'exercices pratiques réalisés sur terminal (logiciel CHESS).

Dans une première partie (deux journées), on présentera les concepts et outils de base :

- Naissance des éléments (cosmochimie, nucléosynthèse, datation par les isotopes radioactifs, fractionnement des isotopes stables);

- Introduction à l'organisation des milieux naturels (atmosphère, eaux, roches, et sols) ; comportement des polluants dans ces différents milieux ;

- Méthodes mathématiques et informatiques à la base de la modélisation géochimique et présentation des bases de données.

Une seconde partie (trois journées) met en jeu des exercices pratiques conçus d'après des cas réels, visant à montrer comment extraire de l'information disponible les mécanismes et paramètres pertinents pour la modélisation, et à utiliser la modélisation pour arriver à des solutions techniques aux problèmes posés:

- Hydrochimie, équilibre ionique et processus réactionnels au sein des eaux naturelles; genèse des pluies acides ;

- Genèse d'un gisement métallique : le plomb dans un gisement de type Mississipi-Valley;

- Impact des activités industrielles sur la qualité des eaux : drainage acide de rejets miniers sulfurés, impact d'une décharge de produits fluorés, production de matières en suspension dans des effluents d'industrie chimique.

Prerequisites :
Aucune connaissance spécialisée particulière

Course exam :
Examen individuel en fin de stage (dernière demi-journée), comportant une question générale et un exercice appliqué.

Couleur, science, design

(MP09)

Key words: Couleur, effets visuels, perception, matériaux colorés, colorants, céramiques, arts appliqués, design industriel, traitement d'image, photographie
Language: French
Institution: Ecole Nationale Supérieure des Mines de Paris
Professor Responsible: Béatrice AVAKIAN, Direction des Etudes, ENSMP
Tel: 33 1 40 51 92 41 - **Fax:** 33 1 43 54 18 93 **Email :** beatrice.avakian@ensmp.fr
Professor(s) participating in the teaching of the course: Daniel FARGUE, Direction des Etudes, ENSMP, Georges AYATS, plasticien, François DELAMARE et Bernard MONASSE, Centre de mise en forme des matériaux, ENSMP, Amédée DJEMAI, Musée de minéralogie, ENSMP, Christian COURREGES, Martine DURIS et Vonnik HERTIG, ENSAD, Jean SERRA, Centre de morphologie mathématique, ENSMP, Lionel SIMONOT, Ecole Supérieure d'Ingénieurs de Poitiers
Address where the course will be held: 60 boulevard Saint-Michel - 75272 Paris cedex 06
Total number of places: *25, minimum : 10*

Course information

Course description :
Proposer une approche globale de la couleur au travers des sciences physiques et humaines et de ses applications dans les arts appliqués et le design.

Programme to be followed :
Lundi 14 mars
Matin Martine Duris (ENSAD)
Introduction au métier de designer coloriste
Daniel Fargue (professeur, ENSMP)
Approche physique de la lumière et de la couleur
Après-midi François Delamare (Centre de mise en forme des matériaux, ENSMP)
Les matériaux de la couleur
Mardi 15 mars
Matin Jean Serra (Centre de morphologie mathématique, ENSMP)
Représentations de la couleur en données polaires adaptées au traitement d'image
Après-midi Georges Ayats, plasticien, et Lionel Simonot (maître de conférences, Ecole Supérieure d'Ingénieurs de Poitiers)
Les catégories de la couleur vues par un peintre et un physicien
Mercredi 16 mars
Matin Amédée Djémai (Musée de minéralogie, ENSMP)
La couleur dans les minéraux
Après-midi Manufacture nationale de Sèvres
Visite d'application aux céramiques
Jeudi 17 mars
Matin Christian Courrèges, photographe (ENSAD)
Après-midi Manufacture des Gobelins
Visite d'application aux teintures de tissus
Vendredi 18 mars
Matin Bernard Monasse (Centre de mise en forme des matériaux, ENSMP) et Vonnik Hertig (designer coloriste en architecture et design produit, ENSAD)
Gammes de couleurs des téléphones portables
Après-midi Martine Duris (Ensad)
Travaux pratiques

Prerequisites :
Notions de base sur la lumière et les rayonnements

Course exam :
Questionnaire (QCM et questions de réflexion)

Geointelligence Applications to Natural Resources Evaluation and Management

(MP18)

Key words: Remote sensing, GIS, data analysis, integration techniques, modelling of natural resources, economic evaluation, multi-criteria decision analysis, risk assessment, environmental assessment, project management
Language: English
Institution: Ecole Nationale Supérieure des Mines de Paris
Professor Responsible: Jean-Marie MONGET, Centre d'informatique géologique
Tel: 33 4 93 95 75 13 - **Fax:** 33 4 93 65 43 04 **Email :** monget@cig.ensmp.fr
Professor(s) participating in the teaching of the course: J-M MONGET, ENSMP and B. BARRAQUE, Ecole Nationale des Ponts et Chaussées _ E mail : barraque@latts.enpc.fr
Address where the course will be held: 60 boulevard Saint-Michel, 75272 Paris Cedex 06
Total number of places: *20, minimum : 10*

Course information

Course description :
This course provides an introduction to the problems of knowledge extraction from networked databases of Earth images and digital maps. It is focused on practical applications to natural resources management and economic evaluation (water and energy resources , oil & gas, minerals, agri-business and environmental problems). It is organised both with teaching sessions and labs (practicals) including hands-on initiation to data integration techniques, resource economic evaluation and multicriteria mediated decisions.

Opening the minds of participants to the many facets of geo-data processing using the wealth of information available on the Internet with particular focus on Earth observation from space. Developing a practical experience in ways of extracting useful knowledge regarding natural resources management using on-line software collaborative techniques. Understanding the complexity of resources evaluation and ways of mediating the various conflicting management objectives and risks using multicriteria decision analysis.
The course offers a clear understanding of the multidisciplinary issues involving the coupling between geo-imaging methods, the modelling of natural processes and the economic evaluation of resources.

Programme to be followed :
Geo-information - Its nature and organisation Introduction to remote sensing and geographic information systems. Data search and intelligence tools for Internet/Intranet sources. Image and map data queries.
Data processing, visualisation and integration techniques Visualization and basic image understanding. Digital cartography. Processing data for structural and thematic interpretation. Multi-thematic integration (ex : meteorology, geophysics, geology, hydrology, ground maps and remote sensing).
Assessment of resources: Extraction of relevant information regarding resource parameters from integrated geo-data sets. Resource modelling and economic evaluation. Consistency and data reliability checking methods. Various examples related to water and energy resources, oil & gas and minerals.
Multicriteria decision scenario : Design of collaborative decision support methods. Evaluation of environmental as well as socio-economic and geopolitical factors. Performing a multicriteria decision analysis and final resource economic risk assessment.

The main course is followed by a two day session on processing data and solving a practical cases in water-energy resource evaluation. Students will be organised in project teams. Each student will be able to access course material and case history data along with software from the Internet.

Prerequisites :
Basics in statistics. Linear algebra. Previous knowledge of statistical decision analysis and basic project economics is appreciated but not required.

Course exam :
The students are offered a 3 weeks period for finalizing the writing of a short report based on the practical sessions. Notation will be based on report content and level of understanding of the subject.

Game Theory

(CTU8)

Key words: game theory, non-cooperative game, cooperative game, repeated game, optimal decision, utility theory
Language: English
Institution: Czech Technical University in Prague
Professor Responsible: Magdalena Hyk_ová
Tel: +420 2 2489 0709 - **Fax:** +420 2 2489 0702 **Email :** hyksova@fd.cvut.cz
Professor(s) participating in the teaching of the course:
Address where the course will be held: Czech Technical University, Faculty of Transportation Sciences, Na Florenci 25, 110 00 Prague 1, Czech Republic
Total number of places: *max. 25, min. 5*

Course information

Course description :
Game is a mathematical model of any decision situation, the result of which depends on the decision of at least two different individuals. Since such situations can be found in almost all fields related to our lives, the domain of applications of game theory is exceptionally broad and rich. It covers economics, industry, political and social sciences, transportation, warfare, biology, ethics and many other branches. Not only represents game theory an outstanding opportunity to persuade a wide audience of the importance, usefulness and even attractiveness of mathematics, it leads mathematicians and technicians to such fields as ethology, evolutionary biology, social sciences, etc., that would otherwise remain marginal for many of them. The aim of the course is to provide the survey of game theory and its fascinating applications.

Programme to be followed :
The course consists of lectures and practical exercises. To clarify general concepts and to familiarize students with them, each theoretical exposition is immediately followed by an exercise devoted to practical applications, as well as to further discusion of relevant concepts. The course covers:

1. Classification and mathematical models of decision situations, history
2. Utility theory, rational choice theory
3. Explicit form games
4. Normal form games
5. Bimatrix games, methods for equilibrium strategies search
6. Repeated games
7. Antagonistic conflict _ theory of matrix games
8. Two-person cooperative games without transferable payoffs
9. N-person cooperative games
10. Power indices
11. Decisions under risk and uncertainty
12. Decisions in conflicts against p-intelligent players

Prerequisites :
Basic undergraduate calculus.

Course exam :
Written.

Elastic and Inelastic Analysis of Heterogeneous Materials

(CTU9)

Key words: Heterogeneous materials, multi-scale modeling, upscaling, numerical homogenization, effective media theories, continuum damage mechanics, cracked media, fibrous and woven composites, cementitious materials, jointed rocks.
Language: English
Institution: Czech Technical University in Prague
Professor Responsible: Michal _ejnoha
Tel: +420-2-2435-4494 - **Fax:** +420-2-2435-0775 **Email :** sejnom@fsv.cvut.cz
Professor(s) participating in the teaching of the course: Milan Jirásek, Petr Kabele, Jan Zeman, Vít _milauer
Address where the course will be held: Czech Technical University, Faculty of Civil Engineering, Thákurova 7, CZ-166 29 Prague 6, Czech Republic
Total number of places: *Total number of places: 25; minimum:10*

Course information

Course description :
Heterogeneous materials are recognized as materials having different material properties from point to point. Examples include conventional engineering materials such as soils, concrete, and wood, as well as the ever growing group of composite materials. Proper constitutive modelling supported by experimental investigation of such materials is currently at the forefront of research activities in the field of both the continuous and discontinuous solid mechanics. The course objectives are to introduce the student to various classical as well as novel approaches currently available for the modelling of heterogeneous materials. Attention is paid to micromechanical modelling and homogenization of metal matrix and polymer matrix composites. In addition, an introduction is given to the basic principles of fracture and damage mechanics combined with micromechanics to provide theoretical background for the non-linear constitutive modelling of cementitious composite materials and structures, jointed rocks etc. Special techniques needed for an objective description of localized failure patterns in softening materials are covered as well.More information available at: http://ksm.fsv.cvut/~courses/program.html, http://cml.fsv.cz/~milan/course2004a.html

Programme to be followed :
Sixteen 1.5-hour lectures:
1. Basic concepts, volume averaging, elementary approaches to determination of effective properties, the Eshelby and inhomogeneity problems (2 lectures),
2. Effective media-based averaging schemes _ dilute approximation, the self-consistent method and the Mori-Tanaka methods (1 lecture),
3. Numerical homogenization of composite materials with periodic microstructure _ unit cell concept, the first-order approach, finite-element-based modelling, FFT-based method (2 lectures),
4. Random composite materials _ description of microstructure, extended Hashin-Shtrikman variational principles, concept of a statistically equivalent unit cell (2 lectures).
6. Applications to fibre-matrix composites, woven composites, masonry structures and perforated webs (1 lecture).
7. Homogenization of cementitious matrices _ basic material components, application of homogenization theories (1-2 lectures),
8. Homogenization of jointed rocks, multi-scale analysis of tensio softening of brittle matrix composites reinforced by short random fibres (2 lectures).
9. Continuum damage mechanics _ micromechanical motivation, mathematical description of isotropic and anisotropic damage, smeared crack models (2 lectures).
10. Localization analysis based on the concept of discontinuous bifurcations (1 lecture).
11. Tools for an objective description of localized inelastic strain _ mesh-adjusted softening modulus, cohesive crack models, nonlocal and gradient-enhanced continua (2 lectures).

Prerequisites :
Basic knowledge of continuum mechanics and numerical methods.

Course exam :
Evaluation through an evaluation test at the end of the course.

The PIV Method in Fluid Mechanics

(CTU10)

Key words: PIV, flow visualization, experimental fluid mechanics
Language: English
Institution: Czech Technical University in Prague
Professor Responsible: Jiri NOZICKA
Tel: (420) 224 352 580 - **Fax:** (420) 224 352 570 **Email :** jiri.nozicka@fs.cvut.cz
Professor(s) participating in the teaching of the course:
Address where the course will be held: Czech Technical University, Faculty of Mechanical Engineering, Technická 4, CZ-166 07 Prague 6, Czech Republic
Total number of places: *20 (course A), minimum 5 (course B)*

Course information

Course description :
Particle Image Velocimetry (PIV) is one of the most progressive experimental methods used in fluid mechanics. With the basic set of experimental set up it allows the investigation on 2D flow fields. The extended version can be used for research of 3D flows, or/and in some special cases, temperature or concentration measurement, as well.
The course is held in two different options·
Course A _ informative (basic) course·
Course B _ applied course
The objective of Course A is to inform participants of the principals of PIV method and to show some axamples of the wide range of applications in fluid mechanics and machinery.
Course B is intended for participants, who want to master the operation of the PIV systém and corresponding software

Programme to be followed :
Theoretical part for all students: 7 lessons, 90 min. each
1. PIV method, its history and development
2. Contemporary systems _ set up for 2D measurement
3. 3D measurement
4. Temperature and concentration measurement (PLIV)
5. Special cases _ micro PIV, 3D and PLIV measurement with basic 2D setup
6. Data evaluation, statistical method used
7. Control systém _ introduction to the software support

Practical part _ Either Course (A): 7 lessons, 90 min. each
Demonstration of some typical applications in the laboratory, presentation of results of technical problems solved.

Practical part _ or course (B): 7 lessons, 90 min. each
Some typical tasks will be investigated by participants under the supervision of lecturer.

Prerequisites :
General knowledge of fluid mechanics and thermodynamics (basic course).

Course exam :
The evaluation of the students acquired knowledge will be based on regular examinations during the practical part of the course.

Sensors

(CTU11)

Key words: Sensors, Transducers.
Language: English
Institution: Czech Technical University in Prague
Professor Responsible: Pavel RIPKA
Tel: (4202) 2435 3945 - **Fax:** (4202) 3333 9929 **Email :** ripka@feld.cvut.cz
Professor(s) participating in the teaching of the course: Dr. Antonin Platil
Address where the course will be held: Czech Technical University, Faculty of Electrical Engineering, Technická 2, CZ-166 27 Prague 6, Czech Republic
Total number of places: *Total number of places: 20; minimum:10*

Course information

Course description :
To present an overview of modern sensors and sensor applications to students with various background

Programme to be followed :
Five 3-hour lectures:
1. Sensor technology. Sensor applications in Automotive industry.
2. Position, velocity and acceleration sensors. Sensors for naviation.
3. Strain, force, pressure and torque sensors. Flow and level.
4. Temperature, chemical and biological sensors. Current sensors.
5. Sensor electronics. Sensor buses. Sensor applications in Aerospace, Safety and Security sector and in the Industry.

Five 2-hour laboratory demonstrations:
1. Position sensors
2. Flow, and level
3. Force and torque
4. Pressure, humidity and chemical sensors.
5. Automotive sensors

4-hour visit to Magnetic Sensors Laboratory, Aerospace instruments laboratory and Automotive systems laboratory at the Department of Measurement: presentation of industrial, research and diploma projects.

Prerequisites :
Basic knowledge of applied physics.

Course exam :
Continuous evaluation through laboratory exercises and an evaluation test at the end of the course.

The Origin of Elements

(TUW6)

Key words: Astrophysics, Stars, Nucleosynthesis
Language: English
Institution: Technische Universität Wien
Professor Responsible: Heinz Oberhummer
Tel: +43-1-58801x14251 - **Fax:** +43-1-58801x14299 **Email :** ohu@kph.tuwien.ac.at
Professor(s) participating in the teaching of the course:
Address where the course will be held: Kontaktraum, Gusshausstr. 27-29, 6th floor
Total number of places: *25*

Course information

Course description :
In the modern view of the cosmos the huge objects the macrocosm (stars, galaxies, clusters, universe) and tiny objects of the microcosm (atoms, nuclei, elementary particles) are intimately connected. This is especially true for the discipline of nuclear astrophysics. For instance, stars are more than 20 orders of magnitude larger than atomic nuclei. The connection between stars and nuclei is twofold. On one side nuclear processes produce the energy so that the stars including our Sun shine. On the other side and still more interestingly deep in the stars the elements ranging from carbon to uranium are created in stars. Literally almost everything around consists of the elements produced in stars. For instance, all the carbon in the DNA and proteins, the calcium in our bones, the iron in our blood, the oxygen in the water in rivers and oceans, and the silicon in stones were created in stars.

The lecture starts with an introduction on the basics of particle and nuclear physics as well as on the structures and evolution of the Universe starting from the Big Bang. The main part of the lecture is devoted to the creation of the elements in the Big Bang, in stars and interstellar matter (primordial, stellar and interstellar nucleosynthesis). Finally we discuss the fantastic fine tuning in our Universe with respect to the existence of life including its cosmological and philosophical implications.

Programme to be followed :
1. Introduction to modern astrophysics and cosmology.

2. Elementary particle and nuclear physics.

3. Structure and evolution of the Universe.

4. Birth, life and death of stars.

5. Origin of the elements in the Big Bang, interstellat matter and stars.

6. Fine-tuning aspects of the Universe.

Prerequisites :
Elementary knowledge of physics

Course exam :
Examination in written form on last course day

How Physics Inspires Science Fiction

(TUW7)

Key words: physics, imagination, creativity, science fiction
Language: English
Institution: Technische Universität Wien
Professor Responsible: Peter Schattschneider
Tel: +43 1 58801 13722 - **Fax:** +43 1 58801 13798 **Email :** schattschneider@ifp.tuwien.ac.at
Professor(s) participating in the teaching of the course: Schattschneider, Hébert
Address where the course will be held: Kleiner Schiffbau Hs/Getreidemarkt 9, HS14/Karlsplatz 13
Total number of places: *25*

Course information

Course description :
This course aims at demonstrating that physics can be entertaining, surprising, and applicable when combined with creativity.

We understand how physics - and more generally a scientific approach - can inspire science fiction writers. We shall critically read selected SF stories and prove or disprove the authors' claims. As a by-product, we learn about prognostics in science and SF, about supernovae, black holes, the role of constants in nature, the impossibility of skyscraper-high spider monsters, and we get a glimpse of the sometimes amusing consequences of Einsteins relativity. The students' imagination will be challenged by the demand to complete a scientific text.

Programme to be followed :
Reading of selected texts
Critical discussions
Scientific basics to judge the authors' claims
Completion of a selected scientific text

Prerequisites :
Basic understanding of the laws of physics (school level)

Course exam :
Writing /explaining a sound SF story (in small groups)

ATHENS PROGRAMME STUDENT COMMITMENT :

REGISTRATION: CONDITIONS & STUDENT RESPONSIBILITIES

-Exchange students that are currently studying at a member ATHENS institution (ERASMUS, Double Diploma students) will not be permitted to return to their Institution and their town of origin to follow an ATHENS Session.

-Erasmus Exchange students whose exchange is officialised by a **Learning Agreement**, must inform their Home Institution of origin of their intention to participate in an ATHENS Session.

-Once registered for an ATHENS course :

- Students commit themselves to attending that course. **Only in the case of major and unforeseen problems**, will Home Institutions permit their students to cancel that registration. All cancellations require the agreement of an official representative of the Home Institution (Director of Studies, Head of Department, Professor in charge of the student's studies, ATHENS General Administrator..).

- ***S*tudents who cancel will be expected to cover all costs incurred by the receiving institution, caused by this cancellation**.

OBLIGATIONS FOR OBTAINING CREDIT FOR THE COURSE FOLLOWED

- No credit will be awarded to students who are not officially registered (by their Home Institution) for a course.
- **Students are expected to follow the entire course programme** in order to receive credit for the course followed.
- In the case of absences during a course, students will receive the mark of 0 unless such students are able to show, that for medical reasons, they could not be present (a medical certificate is thereby required).
- Improper behariour can have an effect on the final mark awarded to a student. Home institutions will be notified by course organising institutions of cases of improper behaviour. A bad final mark for a course, may have consequences on the bursary granted to a student by his/her Home institution.
- All students are expected to validate the ATHENS course followed by passing the "course exam", the form of which is decided by the professor, responsible for the course. It may be an exam at the end of the course or a project or personal research to be sent to the professor on a specific date. No derogation will be accepted. Students who do not respect this Deadline, will receive a mark of 0.
- In order to obtain credit for an ATHENS course, all students are expected to complete the Student Evaluation Form.

ATHENS SESSIONS ABROAD

All ATHENS Sessions abroad consist of two elements: (1)a 5 day course at the receiving institute and, (2) **a European Dimension Programme of normally 2 or 3 days**, depending on what is offered by the receiving institution. This ED-Programme may be planned during the weekend preceding the course period, during the 5-weekdays of the course as well as during the weekend, following the course.

- **Student participants commit themselves to following the entire Session Programme as described above. Only students who participate in both the course programme and European Dimension Activities will be eligible for an ATHENS bursary. Students who do not pay the European Dimension Fee, will not receive a mark for their course.**

- Depending on their institution of origin, students may benefit from financial aid for their stay abroad. This bursary can cover part of the travel and living costs involved in the stay.

- The student participants assume the cost of lodging and meals.

- All students requesting assistance in finding **housing** from the course organising institution must expect to find very **"simple forms of lodging"**. Once such a request has been made, such students are expected to occupy that lodging for the entire period of their stay, unless, for major and unexpected reasons they must leave that lodging, or have been forced to shorten their stay.

- During their stay at the foreign institution, participating students are expected to inform local ATHENS General Administrators of any problems which may arise. This must be done prior to any action taken on the part of the students. If necessary, the local ATHENS representative will contact the Institution of origin in order to find a solution to the problem at hand.

NAME : **UNIVERSITY OF ORIGIN :**

I have knowledge of the following. Signature of the student :

For ATHENS STUDENTS : THINGS TO KNOW

1.When registering :

- **Make 3 or more course choices :** so as to obtain at least one of these choices
- **Be sure :** you are able to fund the costs (travel, and living costs) & that you are « free » to leave your university over the ATHENS Session dates
- Make sure data is valid on your registration form (e.g. housing)
- **Read and sign the Student Commitment**

2. After Registration :

- Obtain confirmation from your Home institution prior to Registration that you can participate in the Session and for one of your course choices.
- Check on visa requirements.

3.Acceptance for a Session, What it Means :

- You are **committed** to following the course officially awarded to you by the Central Selection Committee in Paris.

4. So as to arrive on time and not miss anything :

- Check the Web site « European Dimension Activities » to see when you are expected to arrive at the course site for the Opening of the Session and when you are expected to leave.
- Reserve as soon as possible your travel arrangements

5. For Further information :

- Consult only your local ATHENS Administrator if you have questions on the Programme.
- Final Details on the Session will be available on the WEB (housing, European Dimension Programme, meeting point etc) some 9 days before the Session.

6. Problems just before or during the Session :

- Each ATHENS site will have an emergency number to be used **only** in case of emergency.

7. During the Session, your obligations :

- You are expected to attend and to actively participate in the course you are following as well as the European Dimension activities.

8. Remember Your Role as an ATHENS Student :

- You are not a simple tourist; you represent your Home institution.

9. Student Evaluations : Your judgement of the course followed :

- Students are asked to complete an Evaluation questionnaire at the end of their ATHENS course, and if possible, on-line. Student evaluations help the Programme to develop. Students' comments are included in the ATHENS Final Report, published twice a year.

10.Marks:

- Marks for the course followed are placed on the Web approximately 1 1/2 months after the end of the Session. An ATHENS course is worth 2 to 3 ECTS credits.

SAMPLE – Evaluation. Completion will be carried out via the WEB.

STUDENT EVALUATION FORM : March 2005 COMPLETE ATHENS SESSION

To be COMPLETED BY ALL STUDENTS *at the end of the course :* Please reply to each question by encircling a corresponding numerical ECTS value from 1-5, with 1 being a very low level (not sufficient), 3 being average (acceptable) and 5 being of a top level (excellent).

LAST NAME AND FIRST NAME : .....

INSTITUTION OF ORIGINE : .....

TITLE AND NUMBER OF THE COURSE ……

1) THE COURSE :

How sufficient was the level of your previous background?	1	2	3	4	5
How closely did the course follow the published description?	1	2	3	4	5
Was the length of the course programme sufficient or not?	1	2	3	4	5
How well-adapted was the audio-visual, computer equipment ?	1	2	3	4	5
How sufficient was the documentation?	1	2	3	4	5
How good were the pedagogical methods used?	1	2	3	4	5
What do you think the value of the technical visits was?	1	2	3	4	5
How heavy was your personal work load during this course?	1	2	3	4	5
How do you judge the welcome given by the course hosting institution?	1	2	3	4	5

For the Course, as a whole, what were the:

STRONG ASPECTS :

WEAK ASPECTS :

POSSIBLE IMPROVEMENTS:

Globally, how do you judge the value of this course?

1 2 3 4 5

What course topics would you be interested in following at a future ATHENS Session?

2) THE SESSION:

How do you judge the welcome given by the host institution?	1	2	3	4	5
How high was your interest in the European Dimension Activities?	1	2	3	4	5

Comments, suggestions on the European Dimension Activities :

***« STUDENT EVALUATION FORM »* POUR LA SEMAINE EUROPEENNE/ ATHENS**

: la SESSION de mars 2005

(uniquement pour les étudiants de ParisTech ayant suivi un cours à Paris)

Ce questionnaire doit être completé à la fin du cours

(entourer votre réponse, svp)

NOM ET PRENOM : .....

ECOLE D'ORIGINE : .....

TITRE DU COURS CHOISI : .....

Système de valeur de 1 à 5 (1: très insuffisant; 3 :acceptable; 5 :excellent)

Niveau de votre prérequis pour aborder ce cours ?	1	2	3	4	5
Niveau de conformité avec le programme annoncé ?	1	2	3	4	5
Durée du cours suffisant par rapport au programme?	1	2	3	4	5
Moyens matériels (audio-visuel,informatique) utilisés, adaptés ou pas ?	1	2	3	4	5
Documentation distribuée ?	1	2	3	4	5
Méthodes pédagogiques?	1	2	3	4	5
Valeur ajoutée des cours hors de votre école ?	1	2	3	4	5
Valeur ajoutée des visites ?	1	2	3	4	5
Importance de votre travail personnel durant le cours ?	1	2	3	4	5
Votre jugement sur la structure d'accueil?	1	2	3	4	5

VOTRE BILAN DE CE COURS

POINTS FORTS :

POINTS FAIBLES :

AMELIORATIONS POSSIBLES:

Globalement comment estimez-vous ce cours

1 2 3 4 5

Quel autre thème souhaiteriez-vous traiter durant une semaine "Semaine Européenne"/ ATHENS ?`

Member Institutions

Les Institutions membres

Budapest University of Technology and Economics (BUTE)

BUTE was founded in **1782** by Austrian Emperor Joseph II. Nowadays it is one of the largest Hungarian higher education institutions, the numbers of **students** and professors are about **15.000** and 1.000 correspondingly.

The **goal** of the Budapest University of Technology and Economics **is to train professional engineers** who are capable of high-level creative technical work, who can organize and supervise production and infrastructure, and who are qualified to perform scientific research, participate in technical development, solve engineering problems and implement solutions. In addition to educating engineers and teachers of engineering, the University **provides continuing education** through:

- graduate programmes in engineering specialisations, including those for the managers of technical plants,
- refresher courses to inform professionals about new scientific developments which affect their work,
- doctoral programmes, guidance and instruction for scientific research fellows.

The University takes special pride in the contributions made to Science, Engineering, and Culture through its faculty, graduates, and researchers. Several **Nobel Prize laureates** have been associated with the Budapest University of Technology and Economics: Dennis Gábor (Physics), George Hevesy (Chemistry), Eugene Wigner (Physics), György Oláh (Chemistry) and János Harsányi (Economics). **Notable personalities** have also studied or taught at BUTE: John von Neumann, the inventor of the computer ; Edward Teller, nuclear physicist ; Leo Szilárd, known for his work on nuclear chain reactions ; Marcell Breuer, architect ; Theodore von Kármán, aerodynamic scientist ; Ern Rubik, inventor of the famous cube ; Donát Bánki, co-inventor of the carburetor ; Károly Zipernowszky, one of the inventors of the transformer ; Dénes Mihály, one of the inventors of television.

Organisation and Administration of the University. The Budapest University of Technology and Economics functions under the supervision of the Hungarian Ministry of Education. The executive functions of the university are carried out by the University Senate and the Rector. BUTE has 8 faculties: Architecture, Chemical Engineering, Civil Engineering, Economic and Social Sciences, Electrical Engineering and Informatics, Mechanical Engineering, Natural Sciences, Transportation.
For More Information: http://www.bme.hu

Delft University of Technology (TUDELFT)

Students and Staff
13 000 students in 15 engineering programmes , 800 Ph.D students
2 200 scientific staff. 2 680 non-scientific staff
The 15 Programmes at Delft University of Technology :

Systems Engineering,	Industrial Design Engineering
Policy Analysis & Management	Earth Sciences
Architecture	Civil Engineering
Applied Physics	Marine Technology
Material Science	Technical Informatics
Chemical Technology	Electrical Engineering
Technical Mathematics	Aerospace Engineering
Geodetic Engineering	Mechanical Engineering

Tradition
Delft University of Technology is the largest Engineering institution in the Netherlands. It was founded in 1842. The University has a tradition of providing high level education and research and has excellent experimental facilities.

Student Organisations
Student organisations play an important role at the University. Each programme has its own student organisation that deals with excursions, job placements and extracurricular activities. There are a number of different fraternity-organisations located in the historic centre of Delft, some of them have been there for more then a century.
International Cooperation and Student Mobility
Delft University of Technology has a strong international cooperation policy in which student mobility plays a major role. The target is to have 50% of our graduates with international experience.
The University is active in a number of international Engineering organisations. At present the rector of the University is president of CESAER. The University was one of the founders of the Leuven Network, a university network of six Engineering institutions that exchanged 800 students under the ERASMUS programme. Formal cooperation agreements have been established with a number of high level Engineering institutions from all over the world. For nine study programmes, Delft University of Technology also offers a two year Master of Science programme in the English language.

Intensive Course Programmes in ATHENS
Delft University will organise at least three intensive course in March, 2002. Students are invited to apply for a place at one of the courses. In addition to the scientific content of the courses, special excursions and visits will be organised to indicate the important historical, cultural and technological role of the Netherlands in Europe.

For More Information :
Student Advisory Office - Delft University of Technology - PO Box 5, NL-2600AADelft- The Netherlands,
tel : 31-15-27 88 012 - fax 31-15-27 85 690 - mailto: dir.ssc@tudelft.nl
On WWW : home page : www.tudelft.nl < http: //www.tudelft.nl >

Katholieke Universiteit Leuven (K.U.Leuven)
Faculty of Engineering

Prof. Dr. ir. Y. Willems , Dean

History

The K.U.Leuven dates back to 1425, but its Faculty of Engineering is of course much younger. From 1864 on, a Special Engineering School was established within the Faculty of Sciences. In 1961, it became an independent Faculty.
The bilingual university was split into two parts in 1968. The Dutch speaking part stayed in Leuven. The French speaking part moved to the new U.C.L. (Université Catholique de Louvain), 30 kilometres away. Both sister universities have prospered and expanded.
The K.U.Leuven Faculty of Engineering now is a knowledge centre in the 'Humbolt' University tradition : the teaching is based on research, or : those who produce knowledge also teach it. The Faculty roughly counts 180 professors, 30 post-docs and 500 research students. Together they teach to about 2500 students.
The Flemish Interuniversity Micro-Electronics Centre (IMEC) is situated on the same campus, as is the Innovation and Incubation Centre from which more than 20 spin-off companies have been launched.

Teaching

The Faculty offers (Dutch spoken) Master courses in the following fields : Architecture, Chemical Engineering, Civil Engineering, Computer Science, Electrical Engineering, Materials Engineering, Mechanical Engineering and Mining Engineering.
The Faculty offers a number of complementary courses and advanced postgraduate Master degrees.
Engineering and technology evolve rapidly. The Faculty therefore initiates and co-operates in many continuing education projects with other universities and with professional societies, also in an international context.

International Dimension

The Faculty has definitely gone international. The Faculty of Engineering at the K.U.Leuven is one of the founding members of CESAER, the Conference of European Schools for Advanced Engineering Education and Research.
The Faculty is involved in joint projects with research centres and private companies world-wide. Research is funded by regional, national and European authorities and by private companies in Belgium and abroad. The Faculty participates in all important European research programmes. It participates in many programmes for student and staff mobility both within Europe (Socrates) and with North American universities. It welcomes Ph.D. students from developing countries through K.U.Leuven and/or VLIR/ABOS projects and scholarships.

Student Life

The K.U.Leuven students are represented in most of the university and Faculty advisory boards. Student associations are well-organised and very active. The old streets of Leuven are an ideal setting for a bustling student life. All year round, the K.U.Leuven and the city of Leuven organise many scientific, cultural and popular events. The geographical situation of Leuven, in the heart of Europe, facilitates the connection with Paris, London, Delft, Aachen, … By train, these cities are only a couple of hours away.

For More Information :

contact the secretariat : M.J. Geerts – Arenbergkasteel – B-3001 Heverlee (Leuven), Belgium – Phone 32-16-32.17.48 – Fax 32-16-32.19.83 **– Email : maria.geerts@ftw.kuleuven.ac.be**

Université Catholique de Louvain (UCL)
The "Université Catholique de Louvain", Louvain-la-Neuve, and its Faculty of Engineering

In 1425 a university was founded in Louvain by decree of Pope Martinus V. In a short period of time Louvain became one of the largest and most renowned European universities. Its fame reached a first climax in the 16th century when one of the university professors in theology, Adrian of Utrecht, was elected Pope; when Erasmus lectured at the university and founded the Collegium trilingue, the first institute to teach Hebrew along with Latin and Greek; and when eminent humanist scholars, such as Juan Vives and Justus Lipsius, the cartographer, Mercator, and the anatomist, Vesalius, did research under the auspices of the University.

In 1968, the University was separated into two universities : the French-speaking "Université Catholique de Louvain" and the Dutch-speaking "Katholieke Universiteit Leuven". During the years 1972-1978, the Université Catholique de Louvain moved from the old town of Louvain (Leuven) to be re-established in the new town of Louvain-la-Neuve at 30 km at the south-east of Brussels.

Louvain-la-Neuve is a unique example of a new town built in the 20th century. It is largely pedestrian, designed with the objective of recreating the atmosphere of the ancient medievial towns, where the interactions between people are favoured by reduced distances from home to work or to school.
The U.C.L. is now organised into 10 faculties and has an enrollment of about 21 000 students, 4 200 of which are foreign students representing all 5 continents. The Faculty of Engineering has 1 700 students.

Engineering Degree

The basic engineering curriculum at the Faculty of Engineering consists of a five year programme of study**,** each year being subdivided in two semesters. Examinations are organized on a semester basis. The programme leads to the degree of "Ingénieur civil", a title which is recognized and protected by Belgian law. The degree is usually considered to be equivalent to the degree of Master of Science and Engineering. These studies are only accessible to applicants who successfully pass an entrance examination.
The first two years of the programme are devoted mainly to a basic scientific training mainly including Mathematics, Physics, Chemistry, Computer Science, Drawing, Projects and Humanities. These two years are called "candidatures"; successful completion of the final examinations leads to the diploma of "Candidat Ingénieur Civil".
The two year programme of basic scientific courses is followed by an additional three years of engineering studies called the "engineering years". When starting the engineering years, all students must select a field of specialization. Available programmes include Civil Engineering ; Mechanical Engineering ; Architectural Engineering ; Electrical Engineering ; Materials Engineering ; Processes Engineering ; Electromechanical Engineering ; Mathematical Engineering and Informatics. In most of these main fields, several sub-options are available.

For More Information :

Université Catholique de Louvain - Faculté des Sciences Appliquée - Rue Archimède, 1
B-1348 Louvain-la-Neuve - Tél : 00 32 10 47 24 61 - Fax: 00 32 10 47 24 66 -Emailsecretaire@fsa.ucl.ac.be
HTTP://WWW.fsa.ucl.AC.BE

Instituto Superior Técnico Lisboa (IST)

The Instituto Superior Técnico (IST), created in 1911, is the largest Portuguese university in the area of engineering, science and technology. IST´s mission is to contribute to the development of society by promoting a higher education of outstanding quality in the areas of Engineering, Science and Technology, at the undergraduate and graduate levels, and by carrying out the Research & Development activities which are essential to ensure the highest standard of education.
The Mission of IST thus reflects the three activities that define the concept of the research university : Education, Research & Development, and Links with Society.

Education

Within its *principal function*, IST aspires to teach according to the expectancies of the excellent students that IST wants to attract, and corresponding to the needs of society in general and the productive tissue in particular. Teaching activities include 19 undergraduate programmes (Aerospace Engineering, Applied Mathematics and Computer Science, Biological Engineering, Biomedical Engineering, Chemical Engineering, Chemistry, Civil Engineering, Electrical Engineering and Computer Science, Environmental Engineering, Industrial Engineering, Industrial Engineering and Management, Information Science and Computer Engineering, Materials Engineering, Mechanical Engineering, Mining Engineering and Earth Resources, Naval Architecture and Marine Engineering, Physics Engineering, Territorial Engineering) each one with a 5 years duration (10 semesters). There are 23 Master's Programmes, each with a duration of 1 year of course work and the elaboration of a thesis, and, finally, there are several areas for doctorates, according to the IST expertise. At the moment there are 10 000 students : 8 300 are undergraduates and 1700 post graduates.

Research and Development

Complementary to the teaching activities, R&D aims at promoting the scientific knowledge and to contribute to development of applied engineering and technology projects. Moreover, R&D is intended to strengthen the quality of teaching excellence. R&D activities are carried out, mainly, through the development of PhD's. There are 11 departments at IST (Chemical Engineering, Civil Engineering, Electrical Engineering and Computer Science, Materials Engineering, Mathematics, Mechanical Engineering, Mining Engineering, Physics, Informatics Engineering, Economics and Management, and finally, Naval Architecture and Marine Engineering) corresponding to broad areas of R&D. This activity is funded through EC funds Portuguese industry and the Portuguese governmental agency for R&D.

Links with Society
Links with society are reinforced through the development of other complementary activities, such as vocational training, rendering of services and consulting services.

Resources
IST has a teaching staff of 956, of whom, 570 have doctorates. There are 622 non-teaching staff. IST *campus* has a total area of 84.000 m2.
For More Information :
Instituto Superior Técnico - Adelino Galvao
GIRE - International Relations Office - Av. Rovisco Pais - 1049-001 Lisboa
Tel. + 351 21 8417685 - Fax + 351 21 8419280 - E.mail isabel@gire.ist.utl.pt
http://www.ist.utl.pt

Universidad Politecnica de Madrid (UPM)

Universidad Politécnica de Madrid, UPM, is the technical University of Madrid, and the largest technical University in Spain. It has 19 different higher education Engineering Schools scattered in six different campuses, offering both undergraduate programmes of either 3, 5 or 6 years, and PhD programmes in most engineering fields being taught in the country.
UPM has around 45.000 students, 3 500 faculty members, and an annual budget of some 209 million Euros.

The University offers programmes in Architecture, Forestry and Computer Science, as well as in the following engineering fields (in alphabetical order): Aeronautics, Agronomy, Civil Engineering, Environment Sciences, Industry, Geodesy and Cartography, Naval Architecture, Science Materials, and Telecommunications. In addition, PhD. programmes are offered in all of the above mentioned fields.
International co-operation is one of the main goals of UPM; therefore the University participates in numerous international collaboration schemes both within and outside the European Union, such as SOCRATES (ERASMUS, LEONARDO, LINGUA.) TEMPUS, ESPRIT, ALFA, INTERCAMPUS, VULCANUS, and others.
UPM has also signed a good number of bilateral educational exchange agreements with similar universities in Europe, USA, Japan and Australia. Some of these agreements include double degree programmes, where participating students can obtain both universities' degrees.
Universidad Politécnica de Madrid is also an active member in many international associations such as CESAER, SEFI, EAIE, BEST, CRE, IAU, IEEE, and others.

For More Information : www.upm.es or contact:
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Politecnico di Milano

The Politecnico di Milano is a University teaching technology supported by an outstanding tradition and strongly committed to innovation.The Politecnico di Milano was established in 1863 as a State university. It consists of Schools (Facoltà) of Engineering, Architecture and Industrial Design and it is Italy's largest institution in terms of student population in these fields.

The number of students enrolled in all Campuses is approximately 42000:
about 26000 in the Colleges of Engineering, about 12000 in the college of Architecture and 4000 in Industrial Design.

The Politecnico di Milano is structured in a network of Schools spread over the Lombardy region with a central administration and management. The Schools are housed in seven Campuses, two of which located in Milan
(Leonardo Campus and Bovisa Campus) and the others in Como, Lecco, Mantua, Cremona and Piacenza.

The educational policy mainly consists in offering different curricula tailored to local needs and to the industrial environment while integrated in a coordinated educational system which enables student mobility within the network.
As of the academic year 2000/01, according to the new Italian law the Politecnico di Milano has started implementing the Bologna Process with the 3+2-year system.

The Politecnico di Milano offers 29 different Bachelor (Laurea), 25 Master of Science (Laurea Specialistica) and 30 Doctor of Philosophy programmes. As far as research is concerned, state-of-the-art laboratories are located in the 18 Departments, with extensive on-site computer facilities.

For More Information : www.polimi.it **or contact:**
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The Technische Universität München (TUM)

A Synonym for Technical Progress

"... to teach the exact sciences and their applications in all branches of higher technology … [and] … to pass on the vital spark of science to the industrial world."
Carl Max von Bauernfeind, Director of the Royal Polytechnic School of Munich in the inaugural lecture on December 19, 1868

The TUM can trace its actual origins to the independent 'Royal Polytechnic School' founded by King Ludwig II in 1868. In the years since its foundation, during which time Bavaria underwent far-reaching structural changes from agriculture to technology, the TUM has made noted contributions to engineering and science.

The TUM has produced a large number of leading scientists and engineers. The liquefaction of air by Carl von Linde (1895), the invention of the diesel engine by his student Rudolf Diesel (1897), the discovery of the structure of hemoglobin by Hans Fischer (1930 Nobel Prize for Chemistry), the discovery of recoil-free gamma-ray resonance absorption by Rudolf Mößbauer (1961 Nobel Prize for Physics), and the establishment of organometallic chemistry as a field of science by Ernst Otto Fischer (1973 Nobel Prize for Chemistry) stand for a large number of pioneering inventions and discoveries made at the TUM.

Munich, Garching, Weihenstephan - The TUM Campuses

Today the TUM is divided into 12 faculties with 480 professors (of which 250 are chair holders at the university and in the teaching clinics) 9.500 employees and approximately 20.000 students. The core university areas, namely the Faculties of Architecture; Civil Engineering and Surveying; Electrical Engineering and Information Technology; Economic and Social Sciences; Medicine; and Sports Science, are all situated at the Main Campus in Munich, the location of the University Management and central administration offices. Freising, a town 30 kilometers north-east of Munich, is the location of the Weihenstephan Campus and the Center of Life and Food Sciences, which in turn is home to seven research departments (Basic Biosciences; Plant Sciences; Animal Sciences; Ecology; Ecosystem and Landscape Management; Food and Nutrition; Biogenic Products and Technology of Land Use) and six teaching departments (Bio Sciences; Agricultural and Horticultural Sciences; Forestry Science and Resource Management; Landscape Architecture and Landscape Planning; Nutritional Science and Ecotrophology, and Brewing and Food Technology). The TUM also operates a research campus in Garching, a town on the north-east outskirts of Munich, some 15 kilometers away from the main campus. The Faculty of Physics, the Faculty of Chemistry and the Faculty of Mechanical Engineering have settled down in Garching around the university's research reactor (FRM I). The Faculty of Mathematics and the Faculty of Informatics are located at Garching. A new research neutron source, known as FRM II, was completed at the campus in 2001.

In order to open TUM for more international students, various TUM faculties have introduced English taught bachelor's and master's courses, whereby one example concerns the Master's Program in Industrial Chemistry offered by Singapore's German Institute of Science and Technology, which is run by a TUM subsidiary.

For more Information: http://www.tum.de

Ecole Nationale du Génie Rural des Eaux et des Forêts (ENGREF)

Areas of Expertise in Education Training

- **Forestry :** Since 1824, ENGREF has developped traditional skills for Production Forestry, such as Forest Management; Silviculture of Indigenous and Exotic Species; Forest Ecosystem Studies; Forest Protection; Forestry Economics and Marketing.
  New technologies and concepts are concerned : growth; modelling; advanced wood technologies; genetics; forest ecology; forest conservation; landscape planning; natural resource management and forest planning.
  Tropical and mediterranean forestry : integrated rural development; agroforestry; rural economics and land planning of tropical countries. Tropical forest sciences and ecosystem research are developed at the Kourou centre in French Guyana.
- **Water Management :** One of the major competences of ENGREF. It includes irrigation; drainage; river flow control; watershed management; water supply and sanitation. This programme relies on disciplines such as Hydrology; Special Data Bases and Management; watershed equipment.
  Water Management nowadays means mastering hydraulic multicriteria analysis, regulation on water transfer, pollution sanitation ; and socio economics applied to projects.
- **Land Planning and Public Policy :** ENGREF has developped a competence in Land Planning and in the Evaluation of Public Policy Impact on Rural Areas. Integrated Environnment concerns Agricultural Development and Land Planning. These are three areas which work in synergy for linking answers to social demands.
  Emphasis is given to the study of the consistency between public policies at local, national and European levels.

For More Information : www.engref.fr

L'Ecole Nationale des Ponts et Chaussées (ENPC)

The corps of Engineers of Ponts et Chaussées (Bridges and Roads) was created in 1716. In 1747 the Royal Council issued a decree setting up a specific training programme for State Engineers which was entrusted to Jean-Rodolphe Perronet. In 1997, the Ecole des Ponts celebrated its 250th anniversary.
During the XVIIIth century, teaching was carried out by the most outstanding students in the Institute who took their fellow students in hand and passed on to them their knowledge and skills. After the French Revolution, the Institute built up a teaching faculty and adapted its curriculum and teaching methods to the latest developments in science and technology. Its doors were open to new categories of students, including non-civil servants and foreigners. Among its graduates from this period are famous scholars and engineers such as Cauchy and Navier and later Fresnel, Becquerel and Bienvenue; all of them helped contribute to the remarkable advances made in France during this period in transport and infrastructure networks.
During the 1980's and 90's changes in the curriculum have given students more choices : in addition to the traditional courses in Civil Engineering, Town Planning and Regional Development, students also have the possibility of choosing options in related fields such as Industrial Engineering, Computer Science Environmental Studies, and Economics**.** Students also do a wide range of practical training periods in government and industry, which provide them with professional experience and open the path to a wide variety of careers : graduates from the Ecole des Ponts can be found in all major areas of the economic sector : Construction and Building, Town Planning, Scientific Research, Production and Management, Finance and Banking.
The Ecole des Ponts has 10 research laboratories, 10 «Mastere » degrees, 14 doctoral programmes and awards 50 Ph.D degrees each year. The ENPC has extensive relations with foreign universities and institutes, including joint degree programmes with several European higher educational establishments. During Academic year 2001-2002, there were 311 foreign students studying at ENPC, representing some 64 countries.

For more Information :http://www.enpc.fr

L'Ecole Nationale Supérieure d'Arts et Métiers (ENSAM)

ENSAM was founded in 1780 by Duc de la Rochefoucauld-Liancourt. It is a public higher-education institution where 1 000 engineers graduate each year, in Mechanical and Industrial Engineering.

A Multi-Site National Institution
8 centres : Aix-en-Provence, Angers, Bordeaux, Châlons-en-Champagne, Cluny, Lille, Metz, Paris ; **1** post-graduate institution : Chambéry

Major Fields of Study
Product Development, Materials, Processes, Machine Design, Methods and Industrial Systems
7 Departments
Mechanics and Structures / Materials / Energetics / Computer Science and Mathematics / Control Theory, Electronics, Electrotechniques / Production, Industrial Engineering / Foreign Languages, Human and Social Sciences, Sport
Engineering Programme
3 000 students with : 200 foreign students, 1 000 Engineering degrees awarded annually; 150 students abroad for one or two semesters per year
Double-Degree Programmes : (Franco-German; Franco-Spanish-Portuguese partner universities).
Study and Research
620 administrative and technical staff; 380 full-time teaching staff; 250 full-time research staff
240 doctoral students; 50 Ph.D's awarded each year
17 research laboratories, 7 of them are associated with the (Centre National de la Recherche Scientifique, CNRS)
7 research teams
10 specialized post-graduate programmes of study : predoctoral studies (DEA)
For More Information : http://www.ensam.fr

Ecole Nationale Supérieure de Chimie de Paris (ENSCP)

ENSCP was founded in 1896 by Charles FRIEDEL and Henri MOISSAN (Nobel Prize for Chemistry in 1906) and is one of the leading French "Grande Ecole" in Chemistry and Chemical Engineering. It is also a renowned research centre where basic and applied research cover the following areas :
- Organic Synthesis and Biotechnology
- Energetics and Chemical Engineering
- **Stucture and Properties of Matter, Material Sciences**

The Engineering Programmes of Study are Multidisciplinary and Organized in Five Departments :
- Structure and Properties of Matter
- Energetics, Transformation of Matter and Chemical Engineering
- Organic and Bio-Organic Chemistry and Polymers
- Mathematics and Computor Sciences
- Management, Languages and Communication

Students at ENSCP receive their degree after five years of studies, following the French secondary school "Baccalauréat". In the final year they undertake a personal research project, "microthesis". 25% of the students do this thesis in foreign laboratoires, mainly in Europe, the USA and Canada. The research programme during this last year can also lead to the granting of a predoctoral diploma (DEA), thus enabling students to prepare a doctoral degree. More than one third of the ENSCP's engineer-graduates receive their doctorate (often abroad).
ENSCP has a total of 220 students and a research and administrative staff of 300, of which, 90 are Ph.D students.
For More Information : http://www.enscp.jussieu.fr/

Ecole Nationale Supérieure des Mines de Paris (ENSMP)

Founded in 1783 by the King Louis XVI, and located since 1816 in the Latin Quarter in Paris, the Ecole des Mines de Paris was originally charged with the training of mining engineers and the Corps of Mines. Today, this Grande Ecole prepares students to be the decision makers of tomorrow in all fields of the economy.
Several programmes of study are proposed to students :
The Engineering Degree Programme (five years of study) : 120 degrees / year.
Other Post-Graduate Specialized Programmes : 100 degrees / year
-The "Ingénieurs du Corps des Mines" Programme
-Institut Supérieur d'Informatique et d'Automatique
-The "Mastère" programmes : 12 months of professionally-oriented study offered to students who have completed their fifth year of higher education.

The Doctoral programme : 100 degrees / year
-DEA : a year (of predoctoral) study
-Doctoral Degree : three years of research.

The Ecole des Mines de Paris has 17 research centres working in 5 areas :
-Earth and Environmental Sciences
-Process Engineering and Energetics
-Materials Science and Engineering
-Applied Mathematics, Computer Science, Robotics, Systems and Control
-Social and Economic Sciences.

For More Information : http//www.ensmp.fr

Ecole Nationale Supérieure des Télécommunications (ENST)

ENST was created in 1878 as the Ecole Supérieure de Télégraphie; in 1934 , the Institute received its current offical name, the Ecole Nationale Supérieure des Télécommunications. Today, ENST is recognized as the leading Grande Ecole in the area of the Sciences and Techniques of Telecommunications and their Management. Digital and Optical Communications ; Electronics ; Computer Science ; Networks ; Signals and Systems ; Image Processing...are among the ENST research and teaching domains.
Three programmes of study are proposed to students :
-The Engineering Degree Programme : 5 years of study following the French secondary school "Baccalauréat" (concerns 650 students).
-The « Mastère » Programme : 12 months of study in Telecommunications related areas offered to students who have completed their fifth year of higher education (concerns 70 students).
-The Doctoral Programme : 3 years of research in a state of the art Telecommunications domaine (200 students).
ENST is also associated with 12 DEA programmes, one-year predoctoral studies, (concerns about 360 students of which 10% come from the ENST).
The Institute is administered by a Director, assisted by a team of advisors.
Four Scientific Departments and a Department of Languages and Cultures assure the teaching and research activities.
Total scientific staff numbers : 128 with, in addition , an administrative staff of 156.
For years ENST has followed a policy promoting international relations :
Today, 26% of the ENST students following one of the three degree programmes, come from another country. In addition, each year over 130 foreign students spend 3-12 months doing research in ENST laboratories and some 20 professors from around the world carry out sabbatical periods with ENST departments.

For More Information : http://www.enst.fr

Ecole Nationale Supérieure de Techniques Avancées (ENSTA)

One of the leading French 'Grandes Ecoles', ENSTA - (National Engineering Institute for Advanced Technologies) trains highly qualified engineers with a global knowledge. Their background enables them to design, build and manage complex industrial systems.

The Institute's specific profile lies in high technology. ENSTA graduates work in a vast array of branches, ranging from the Automobile Industry to Petroleum, Information Technology and Electronics ; Engineering ; Transport ; Shipbuilding and even Financial Services. Their functions range from R&D to Industrial Production and Management engineers. Many of them evolve in the course of their career from technical tasks to high-level management functions.

About 160 students graduate every year. The engineering programme lasts for 3 years. It combines a broad scientific core, specialized technical areas and general courses (such as Communication, Economics, Finance, Law and two foreign languages) as well as a part-time research project and various internships with companies.

Teaching is done by researchers from ENSTA's five Research Laboratories (Mechanics, Electronics and Computer Science, Chemical Engineering, Optics and Physics, Applied Mathematics) as well as by some 1 000 engineers from industry.
For More Information : www.ensta.fr

Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI)

This institution, established in 1882, belongs to the city of Paris.
ESPCI has one objective : to train polyvalent engineers in all fields of Physics and Chemistry.
As a consequence, a specific feature of the programme is the integration of research and education for industrial research. All the students follow courses in Physics. Chemistry and Biology, as well as Mathematics, Computer Science and Foreign Languages. They have daily contact with experimental science and, during, the first three years, 15 hours per week are spent in research laboratories. During the third year, a four-month industrial internship is required of all students. The last year is devoted to research at an Msc. level. The educational system is original among French institutions and includes tutorials for each course ; each group of four students receives guidance and advice from a tutor. In addition, there is an excellent faculty to student ratio : more than 60 teaching professors with only 72 students per class per year.
For years, ESPCI has achieved a world-wide reputation in research, testified by its six Nobel Prize winners, going from Pierre and Marie Curie to Pierre-Gilles de Gennes and Georges Charpak. Presently, there are 18 research laboratories with over 250 researchers including 40 foreign researchers**.** A wide variety of research topics are developed in the areas covering Physics, Chemistry and, more recently, Biology**.** These topics deal with both basic and applied research, leading to collaborative activities with various university laboratories as with French and foreign firms. Each year more than 20 doctoral theses are defended and over 40 national and foreign patents are obtained.

For More Information : http ://www/espci.fr

The Institut National Agronomique de Paris-Grignon (INAPG)

INAPG, a public institute of Higher Education and Research, (under the aegesis of the Ministry of Agriculture and Fisheries) is one of the select French "Grandes Ecoles". The Institute results from a merger, in 1971, of the prestigious Institut National Agronomique in Paris (1876) and the Ecole Nationale Supérieure Agronomique de Grignon.
INAPG trains high-level engineers and executives in the fields of Agriculture and Food Sciences, Biology, Environment, and Services, and also awards doctorates. The Institute is involved in research in association with teams from national research institutes (INRA, CNRS, CEMAGREF...) and French universities in technology transfer, and in international cooperation. INAPG has strong ties with industry through research programmes, consultancy, apprenticeship, and through professional training schemes.
INAP-G in Brief
Two sites :
Paris and Grignon; 40 000 square metres of teaching, research and administrative facilities; 950 ha of experimental farms;
130 researchers from National Institutes, mainly INRA;
1 200 students including doctoral candidates; 150 teaching-researchers.
Six departments for education and research, with a permanent staff of 470 : 1. Agronomy and Environment (staff 105) - 2. Animal Sciences (67) - 3. Biology (73) - 4. Organization and Modelling of Information and Processes (27) - 5. Economic and Social Sciences (41) - 6. Food and Biological Science and Industry (157)
For more information : http :/www.inapg.inra.fr/

Czech Technical University in Prague (CVUT)

Czech Technical University in Prague is **the oldest technical university in Central Europe (founded in 1707)** and the largest such University in the Czech Republic (**over 20 000 students**). Other important dates in the history of the University are 1803, when the studies were reformed on the model of the Ecole Polytechique de Paris; 1869, when the formerly bilingual University was divided into separate Czech and German institutions; 1920, when the Czech Technical University in Prague was formed, and 1989, when the so-called velvet revolution led the University back into close contact with western Europe.

The university has six faculties: Civil Engineering, Mechanical Engineering, Electrical Engineering, Nuclear Sciences and Physical Engineering, Architecture, and Transportation Sciences. There are also a number of institutes and a Business and Innovation Centre.

Traditionally students take an 11 or 12 semester full-time study programme leading to the Inzenyr (Ing.) diploma, equivalent to a Master's degree. There are at present over 1 500 students working on PhD programmes.

Some Bachelor programmes have been established in the last 12 years, and the university is now going over **to the Bachelor - Master - PhD system**. The European Credit Transfer System (ECTS) is in use at all faculties.

After the period of isolation (1938 – 1989) the University has engaged enthusiastically in international activities, which it regards as a source of a wide range of positive influences. In general, the University is happy to join in with all efforts to harmonize European and international education and to remove barriers to international cooperation in education and research.

For more information: http://www.cvut.cz/
International Office: http://www.cvut.cz/international.html

Norwegian University of Science and Technology
(Norges Teknisk- Naturvitenskaplige Universitet ; NTNU)

Introduction
NTNU was established on January 1, 1996. It replaced the University of Trondheim, which included the Norwegian Institute of Technology (founded in 1910), the College of Arts and Science and the distinguished Museum of Natural History and Archaeology. NTNU is an innovation in the Norwegian academic world. As the name shows, it is a national centre for technological education and research founded on knowledge within the natural sciences. However the premises for the establishment of NTNU also state that it is to be a university with social commitment and have a comprehensive approach to the challenges we face. Thus NTNU is also to have broadly-based expertise in the classical university disciplines and academic eminence **in the Social Sciences and Humanities.**

Location :
NTNU is located in Trondheim, Norway's third largest city, in the Troendelag region of Norway.

Number of Students :
18 000. NTNU is Norway's second largest university.

International Exchange Students/Guest students 2001-2002 : 1000

Study Areas :
As of January, 1996, NTNU is organized into the following Faculties:

Architecture, Planning and Fine Arts
Civil and Environmental Engineering
Electrical Engineering and Telecommunications
Physics, Informatics and Mathematics
Applied Earth Sciences and Petroleum Engineering
Chemistry and Biology
Marine Technology
Mechanical Engineering
Humanities
Social Sciences and Technology Management
Medicine

Exchange Programmes :
NTNU participates in exchanges through the NORDPLUS and SOCRATES/ERASMUS Programmes. Several Leonardo placement projects are coordinated from Trondheim. ECTS is introduced at all faculties. NTNU is a member of the SANTANDER Group, which comprises 37 European universities and 2 USA partners. Bilateral agreements exist with institutions in many parts of the world including Ethiopia ; Ghana ; South Africa ; China ; India ; Nepal and the USA.

For More Information :
For exchange students about NTNU and Trondheim can be found under the following
WEB address : http://www.ntnu.no/intersek/.
For further details please contact the International Office :
NTNU - International Office - Hoegskoleringen 1 - N-7034 Trondheim
Fax : +47 73595210 - Tel : +47 73595700 - Email: international@adm.ntnu .no

Technische Universität Wien (TU Wien)
Vienna University of Technology

The Vienna University of Technology (VUT) was established in 1815 as k.k. Polytechnic Institute and received its university status in 1975.

It has always been a concern of the VUT to position itself amongst the top-ranking universities both on national and international level by means of the most up to date curricula and practice oriented teaching and research.
Teaching at the VUT is characterised particularly by imparting a broad fundamental knowledge combined with the option of acquiring specialist knowledge in different fields.
The VUT puts very much emphasis on the linkage between theory and practice, which manifests itself by continuous participation of students in research programmes.

VUT at a glance:

Faculties:
Architecture and Regional Planning
Civil Engineering
Mechanical Engineering
Electrical Engineering and Information Technology
Computer Sciences
Technical Chemistry
Technical Mathemathics and Geoinformation
Technical Physics

Fields of Study:
Diploma-Studies (5 years):
Architecture, Regional Planning, Civil Engineering, Mechanical Engineering, Industrial Engineering, Process and Chemical Engineering, Technical Mathematics, Technical Physics, Technical Chemistry, Surveying and Geo-Information, Secondary School Teacher Accreditation

Bachelor-Studies and Master Studies (3 + 2 years):
Actuarial Mathematics, Business Computing, Data Engineering & Statistics, Media-Informatics, Medical Informatics, Software and Information Engineering, Technical Informatics, Power Engineering, Automation Engineering, Telecommunications, Computer Engineering, Microelectronics

Doctoral Studies (2 years)

Students: 18.931 (19% foreigners)
Graduates (per year): 860
Teachers/Researchers (full time): 1.065
Departments/Institutes: 87
Location: Central Vienna, Karlsplatz 13
Home Page: www

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