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International Master Degree in Engineering in the area of Telecommunications and Networks

Further your studies in a French engineering school, join our one year training program taught in English language and prepare a **Master Degree in Engineering in the area of Telecommunications and Networks.**

Recognized by the French Ministry of Higher Education and Research, the diploma is awarded upon successful completion of a specialized program of study and opens the way to a professional career in an intercultural context or to further education towards the doctoral thesis.

TRAINING LOCATION: Admitted students will be trained at the engineering school of Conservatoire National des Arts et Métiers – *le Cnam*[1], located at the centre of Paris.

Created in 1794, during the French Revolution on the location of a medieval monastery, *le Cnam* is a unique French institution of long-standing and deep scientific tradition. Nowadays, thanks to its integrated network, *le Cnam* spreads higher adult education and life-long training to 100 000 students in France and abroad.

Le Cnam holds 25 research teams and offers 36 doctoral programs in a variety of disciplines strongly oriented toward technological research.

Le Cnam engineering school[2] - Eicnam - delivers each year 1,000 engineering degrees in 24 specialized fields related to industrial science and information technology.

We teach everyone everywhere

THE TEACHING TEAM is composed of members of two departments.

The first one is the Electronic, Automatic and SYstems (EASY) department whose members are implied in two research teams: one is dedicated to electronic architecture, signal and image processing and telecommunications while the other one is involved in communication systems and micro-systems.

The second department is computer engineering – composed of networking, system and multimedia team. The associated doctoral school is EDITE[3] from Paris.

ADMISSION AND PROGRAM OVERVIEW : After successful completing their first year master degree program in their home country, students from partner universities may get additional experience and a double diploma by complementing their engineering studies for one year in Paris, France.

After one semester classes, they will do an internship in a company to work as part of a project team.

A contribution to a research project conducted in collaboration with their home university may, if required, complete the student's training in France.

CONTACTS (INFORMATION AND APPLICATION):
- Professor Pascal Chevalier, (pascal.chevalier@cnam.fr), Cnam professor, researcher at Cedric in charge of master program.
- Julie Marbot, (julie.marbot_amelineau@cnam.fr) International program development at *le Cnam* engineering school

FIND OUT MORE:
(1) http://the.cnam.eu/
(2) http://ecole-ingenieur.cnam.fr/
(3) http://edite-de-paris.fr

PROFESSIONAL OPPORTUNITIES: This training offers possibilities to start a career in line with the changing world of computer networks and telecommunications (fix or mobile). The convergence of communication networks that carry either voice, datas and images is now operating. As an example, let us quote the migration of 3G and 4G mobile systems toward full IP transmission.

Industrial and telecommunications networks, telecommunications network operators, enterprises of the internal and external computer networks are hiring those able to understand such systems in their entirety.

In this prospect, the program offers a choice between two courses:

either high technology flows or techniques of business networks. The former focuses on technological bases of transmission, propagation, on the basis of optical telecommunications networks and develops a general competence to deal with the rapid evolution of networks.

The latter focuses on mastering the techniques of business networks: hardware architecture and broadband transmissions, network protocols, databases access and exchange of multimedia data, network engineering, distributed systems.

MASTER'S SYLLABUS : 800 heures

October to March

High data rate Technologies Option

Radiocommunications systems: link budget, modern wave-forms (single and multiple carriers), multiple access

Mobile transmissions: transmission channel characteristics; advanced telecommunications technics and systems; systems with high spectral efficiency; mono and multiple antenna systems.

Advanced signal processing for telecommunications: fundamentals of digital transmission systems; transmission and reception processing for wireless communications; advanced signal processing for wireless communications.

Enterprise's Networks Option

Engineering of enterprise's networks (Level 1 and 2): know-How acquisition to built enterprise's networks. Knowledge of technical and economical constraints by the use of modelisation tools and effective implementation of networks.

Security and networks: general problems of security and associated solutions. Implementation of these solutions in internet architecture.

Core curriculum

Engineers at work: To widen one's horizon through conferences of skilled engineers sharing their experience. Scientific, societal, environmental, legal issues in a globalizing world that one faces as part of his professional responsibilities. Project management issues and project culture in companies.

Model and representation of the organization: get prepared to analyse and participate to a process of organizational management. Acquire skills to take an active part in companies and evolve within them or other organizations in the economic system.

French as a Foreign Language: develop the five skills of the Common European Framework of Reference for Languages – CEFRL: speaking in a conversation and continuously, writing, listening and reading. Emphasis is also placed on the development of intercultural competence.

Supervised personal project: undertake a professional and/or research project to prepare for business and/or research internship.

From April on

Internship: a professional mission in a company will be supervised by a double-tutoring (*le Cnam* professor and company engineer): as a team member, students will exert their skills and acquire new ones, learn methods and know-how specific to the project culture. Students who wish to acquire research experience may undertake afterwards a second internship within the department research team (under conditions).

Defense of master's thesis: The internship's based report will be defended before a jury composed of professors (both from *le Cnam* and partner university) and tutor from the company.

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Subject Title: Mathematics of random signal (Master 1)

Objectives

The primary objective of this course is to provide mathematical background and sufficient experience so that the student can understand sentences in the language of probability theory, as well as solve probabilistic problems in Telecommunications Engineering programs and applied science. Broad range of topics, such as random vectors, random sequences, convergence of random sequences, random processes and correlation are introduced.

Intended learning outcomes

Upon completion of the subject, students will be able to deal with:

1) The concepts surrounding probability and random processes such as the sample space, conditional probability, total probability, Bayes theorem, and independence.

2) One Random Variable and One Function of One Random Variable.

3) One function of two random variables, two functions of two random variables, moments, covariance and correlation, joint characteristic functions, conditional distributions and moments and minimum mean-square-error (MSE) estimation.

4) Sequences of Random Variables. Distributions and densities, independence, M functions of M random variables, covariance and correlation matrices and joint characteristic functions.

5) Limit Theorems. The Law of Large Numbers. The Central Limit Theorem

6) Random process. Stationarity: strict sense and wide sense. Ergodicity. Poisson Processes. Markov Processes.

7) Applications and practical issues such as the numerical simulation of random phenomena using python.

Course syllabus

Topics:

1. Foundations of Probability Theory
2. Random Variables
3. Distribution and Density Functions
4. Functions and Sequences of Random Variables
5. Expectation. Conditional Expected
6. Characteristic Functions and Moment Generating Functions
7. Ordered Statistics
8. Multivariate normal distribution
9. Elements of Random Processes
10. Limit Theorems
11. Simulation (using numerical Python)

Reading List and References

1. D. Ghorbanzadeh, "Probabilités. Exercices et Corrigés", ISBN: 9782710807476.

2. D. Ghorbanzadeh, P. Marry, N. Point, D. Vial, "Eléments de mathématiques du signal. Exercices résolus." 3ième Edition. EAN13. 9782100519361.

3. K. Venkatarama, C. Kavitha, "Probabilities and random processes", 2ième Edition. ISBN 978-0-471-99828-0.

4. S. Miller, D. Childers, "Probabilities and random processes", 2ième Edition. With applications to signal processing and communications. ISBN-13 978-0123-869814.

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SUBJECT TITLE: DIGITAL SIGNAL PROCESSING (MASTER 1)

Objectives

This course is an introduction to Digital Signal Processing in which we addresses:

- Analog to digital signal conversion concept,
- Discrete signal Fourier and FFT analysis,
- FIR and IIR filtering,
- Introduction to random signal processing,
- Adaptive filters.
- Sampling and analog to digital conversion

Intended learning outcomes

By the end of this course, the students will be able to:
- Characterize the main elements of a digital signal processing scheme, including ADC, DAC, anti-aliasing filter and reconstruction filter,
- Compute the discrete Fourier transform, the z transform of discrete signal,
- Implement digital filters of the FIR or IIR type, and study the stability and the phase behaviour of digital filters,
- Compute the auto-correlation, cross correlation and PSD of discrete random signals,
- Understand the need for designing an adaptive digital filter with coefficients computed based on LMS or RLS algorithm.
- Use Matlab for simulations of digital signal processing.

Course syllabus

1. Introduction
2. Sampling, ADC and DAC,
3. Discrete Fourier transform, FFT and z-transform,
4. FIR filtering
5. Design of FIR filters and applications
6. IIR filtering
7. Design of IIR filters and applications
8. Introduction to discrete random signal processing,
9. Adaptive filters
10. Project: students will be asked to put in practice-assimilated notions to carry out a project describing a practical application. This project will be developed using MATLAB and dedicated digital signal processors.

Assessment methods

Specific assessment methods/tasks	% Weighting
Project	40
Examination	60

Required effort

●Lecture	21 hrs.
●Lab exercises	21 hrs.
●Project	18 hrs.
Total student study effort	60 hrs.

References

1. A.V Oppenheim, R.W. Schafer," Discrete Time Signal Processing", Pearson New International Edition, 3rd edition, 2014.

2. J. G. Proakis and D. G. Manolakis,"Digital Signal Processing: Principles, Algorithms, and Applications", Prentice Hall International, 3rd edition 1996

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SUBJECT TITLE: INTRODUCTION TO SIGNAL PROCESSING (MASTER 1)

Objectives

The main objective of this course is to give to students a clear view on the characterisation (time and frequency domain, spectrum and probability density function) of deterministic and random continuous time signals.

- Time and frequency representation (Fourier transform and power spectral density),
- Study of filtering operations (convolution operation)
- Sampling and analog to digital conversion
- Study of radio broadcasting systems

Intended learning outcomes

Professional/academic knowledge and skills

(a) skills in Fourier analysis and transform, able to go from the time to frequency domain and vice versa,
(b) able to characterize deterministic and random signals in the frequency domain (Fourier transform, random processes, autocorrelation function, power spectral density),
(c) able to characterize amplitude of random signals (random variables, probability density function, cumulative distribution function),
(d) able to study a signal processing chain with addition and multiplication of random signals, able to compute the signal to noise ratio at the output of a signal processing chain,
(e) able to characterize narrow band signals (complex envelope, low pass equivalent chain), able to study a transmission system with amplitude modulation,
(f) able to use Matlab software for simulations of signal processing studies.

Course syllabus

1. Introduction
2. Filtering
3. Fourier series and transform
4. Finite energy deterministic signals
5. Finite power deterministic signals
6. Random processes
7. Random signal and power spectral density
8. Operations (Filtering, addition, multiplication) of random signals
9. Narrow band signals
10. Application to amplitude modulations
11. Case Study: Students will practice their skills in developing a group project representing a real-life application using Matlab software and USRP boards.

Assessment methods

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		a	b	c	d	e	f
1. Assignments	30	x	x	x	x	x	
2. Lab exercises	10	x	x	x	x	x	
3. Project	20			x	x	x	x
4. Examination	40						

Required effort

Class contact	
●Lecture	15 hrs.
●Lab exercises	15 hrs.
Other student study effort	
●*Work on assignments and project; study related material/ team work*	30 hrs.
Total student study effort	60 hrs.

References

1. M. Owen," Practical Signal Processing", Cambridge University press, isbn: 9781107411821, 2012.

2. A.V Oppenheim, A.S. Willsky, S. Hamid, " Signals and Systems", Prentice Hall, 1997

3. J. G. Proakis,"Digital Communications", Mc Graw-Hill, 4th edition,2001

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SUBJECT TITLE: BASIS OF DIGITAL COMMUNICATIONS (1) (MASTER 1)

Objectives

This subject provides students with:

- a general knowledge of digital communication
- an introduction to the field of information theory and the different techniques and solutions to implement source coding and channel coding
- practice in applying the theories, concepts and techniques acquired during lectures through the actual accomplishment of a guided case study project.

Intended learning outcomes

Professional/academic knowledge and skills:

(a) Describe the elements of a digital communication chain according to the Shannon paradigm
(b) Calculate theoretical limits of source and channel coding for a given source and channel
(c) Acquire concepts in source coding and decoding schemes including lossly and lossless source coding
(d) Acquire concepts in channel coding and decoding schemes including block codes and convolutional codes;
(e) Evaluate the performance of a digital communication chain
(f) Be able to implement the associated algorithms

Course syllabus

1. Introduction to digital communications; Shannon paradigm
2. Baseband digital communications: noise, quantization noise, linear and non-linear quantization, line codes, synchronization
3. Limited baseband digital communications: inter symbol interference and Nyquist criterion
4. Bit error rate calculation and application examples
5. Introduction to information theory: source entropy, mutual information,
6. Fundamental theorems of source and channel coding; channel capacity
7. Source coding: Huffman and Lempel Ziv algorithms
8. Linear bloc codes for channel coding: properties, generator matrix and parity matrix, decoding techniques ; cyclic codes, cyclic redundancy check (CRC)
9. Convolutional codes for channel coding: coder structure and Viterbi algorithm

Assessment methods

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		a	b	c	d	e	f
1. Assignments	30	x	x	x	x	x	
2. Lab exercises	10	x	x	x	x	x	
3. Project	20			x	x	x	x
4. Examination	40						

Required effort

Class contact	
●Lecture	15 hrs.
●Lab exercises	15 hrs.
Other student study effort	
●*Work on assignments and project; study related material/ team work*	30 hrs.
Total student study effort	60 hrs.

References

1. J. G. Proakis,"Digital Communications", Mc Graw-Hill, 4th edition, 2001

2. D. Le Ruyet, M. Pischella, " Basis of Digital Communications", Wiley ISTE, 2015

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SUBJECT TITLE: BASIS OF DIGITAL COMMUNICATIONS (2) (MASTER 1)

Objectives

This is a fundamental and core course for students who would like to understand the field and some basic yet important concepts of communication engineering. This course is designed in parallel with " Digital Transmission (1) " and will cover some basic concepts and principles of Digital Communication. This course is essentially designed to help students building a solid background in Digital Communications.

Course syllabus

1. Introduction to digital modulations.
2. Phase Modulation
3. Quadrature Amplitude Modulation
4. Digital Communication Through Band-Limited Channels: Linear Equalization.

Grading

1. Problem sets 10%.
2. Quizzes 15%.
3. Final Exam 75%.

References

1. J. G. Proakis,"Digital Communications", Mc Graw-Hill, 5th edition, 2001

2. S. Haykin, M. Moher : "Communication Systems"' 5th Edition.

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SUBJECT TITLE: NETWORKS AND TELECOMMUNICATIONS (MASTER 1)

Objectives

The objective is to give students a general understanding of networking, in particular:

- Architecture of a communication network
- Main functions
- More detailed view of local and commonly used Wide Area Networks
- Understanding protocols and their structure
- General view of internetworking

Intended learning outcomes

Upon completion of the subject, students will be able to:

- Analyse a network architecture
- Understand the main technologies involves and their operation
- Identify bottleneck and critical parts in the design of a data communication network

Course syllabus

1. Introduction
2. Protocols and Architecture
3. Data Transmission
4. Transmission media
5. Data encoding
6. Data com interface
7. Data Link Control
8. Multiplexing
9. Circuit Switching
10. Packet Switching
11. Asynchronous Transfer Mode and frame relay
12. Congestion
13. Local Area Network
14. Internetwork Protocols
15. Transport Protocols

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Homework

Project 1: due December 20th
Project 2: due January 10th
Project 3: due January 20th
Project 4: due January 27th

All 4 projects will be distributed December 1st
Homework will be based on courses but may require some personal research.
Projects will be corrected/discussed through project sessions (January 7th trough 28th)

Grading

Grading will be: exam 60%, projects 40%

Required effort

Class contact	
●Lecture	40 hrs.
Other student study effort	
●*Work on assignments and project; study related material/ team work*	20 hrs.
Total student study effort	60 hrs.

References

1. Stallings, "Data and Computer Communications", 8th edition Pearson 2007

References will be made to this book chapter, although not required for studying the course.

Subject Title : Networks: complements and applications (Master 1)

Objectives

The objective is to give students an engineering basis in networking, with particular emphasis on:

- High speed network for Lans and WANs
- Interconnection problems and solutions
- Routing in TCP/IP networks
- Security technologies and architectures
- Network administration

Intended learning outcomes

Upon completion of the unit, students will be able to:

- Identify the key elements in a network design
- Design a simple routing and addressing architecture in a TCP/IP environment
- Select an appropriate technology
- Identify security requirements and simple architecture in securing a communication network
- Understand the basic elements of network administration

Course syllabus

1. High speed lans and wans
2. Routing protocols and interconnection (special emphasis on RIP and OSPF)
3. Security architecture
4. Network administration

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Homework

Project 1: due April 1st
Project 2: due April 1st
Project 3: due May 1st
Project 4: due January May 1st

All 4 projects will be distributed March 18th
Homework will be based on courses but may require some personal research.
Projects will be corrected/discussed through project sessions

Grading

Grading will be: exam 60%, projects 40%

Required effort

Class contact	
●Lecture	40 hrs.
Other student study effort	
●*Work on assignments and project; study related material/ team work*	20 hrs.
Total student study effort	60 hrs.

References

1. Stallings, "Data and Computer Communications", 8th edition Pearson 2007

2. Tannenbaum Computer Networks, CCIE Routing TCP/IP vol 1 Cisco Press

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SUBJECT TITLE: WIRELESS MOBILE NETWORKS (MASTER 1)

Objectives

The objective is to give students solid understanding of mobile and wireless networking, in particular:

- History
- Architecture
- Main functions
- More detailed view
- Protocols

Intended learning outcomes

Upon completion of the subject, students will be able to:

- Assist senior architect
- Understand the main technologies involves and their operation

Course syllabus

1. Introduction
2. GSM
3. GPRS
4. UMTS
5. WIFI
6. Conclusion

Grading

Grading will be: exam 100%

Required effort

Class contact	
●Lecture	30 hrs.

References

1. Y.B. Lin, I. Chlamtac, " Wireless and Mobile Network Architectures", Wiley Editor: not required for studying the course

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SUBJECT TITLE: RADIO-COMMUNICATIONS (1) (MASTER 2)

Objectives

The course provides students with an introduction on radio-mobile communications. The detailed objectives are as follows:

- - Study propagation in several environments and deduce link budgets
- - Study frequency-selectivity and time-selectivity in multi-path mobile channels
- - Know the basics of GSM transmissions
- - Study OFDM and OFDMA.

Intended learning outcomes

Upon completion of the subject, students will be:

1. (a) able to characterize different multiple access techniques used in radio-mobile systems
2. (b) able to characterize multi-path channels in time and frequency domains
3. (c) able to characterize frequency-selectivity and time-selectivity
4. (d) able to perform a full link budgets
5. (e) skilled in OFDM
6. (f) able to use Matlab software for simulations of a complete OFDM transmission/reception chain.

Course syllabus

11. Introduction and free-space link budget
12. Radio propagation (path loss, shadowing, fading)
13. Multi-path channel
14. GSM system
15. OFDM
16. Case study (student's project)
17. Case study (student's project)
18. Labs: radio-channel modelization (with Matlab)
19. Labs: GSM link budget (with Matlab)
20. Labs: OFDM transmission/reception chain (with Matlab)

Assessment Methods

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		a	b	c	d	e	f
1. Lab exercises	30	x	x	x	x	x	x
2. Project	20			x	x	x	x
3. Examination	50						x

Required Effort

Class contact	
Lecture	17.5 hrs.
Lab exercises	12 hrs.
Other student study effort	
Work on assignments and project; study related material/ team work	7 hrs.
Total student study effort	36.5 hrs.

References

1.M. Terre, M. Pischella and E. Vivier "Wireless telecommunication systems", July 2013, Wiley-ISTE, pp. 224, (ISBN: 978-1-84821-543-6)

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SUBJECT TITLE : ANTENNA AND DIVERSITY (MASTER 2)

Objectives

The course provides students with an introduction to array processing and spatial diversity for radio-mobile communications. The detailed objectives are as follows:

- To understand the structure, the functions and applications of array processing at reception (SIMO), at transmission (MISO) and at both transmission and reception (MIMO)
- To study the concept of beamforming for Line of Sight propagation
- To study the Shannon theorem of spatial sampling
- To discover an introduction to adaptive array or smart antenna for interference rejection
- To discover how spatial diversity may mitigate the flat fading effects due to a multi-paths propagation
- To discover equalization of frequency selective propagation channels
- To study MIMO systems using spatio-temporal Coding (Alamouti) or Spatial Multiplexing (V-BLAST)

Intended Learning Outcomes

Upon completion of the subject, students will be:

(1) able to understand the main functions of array processing
(2) able to characterize the main parameters impacting the performance of a multi-antenna system
(3) able to evaluate the gain due to spatial diversity on the demodulation performance of a radio-communication link
(4) able to evaluate the gain due to equalization on the demodulation performance of a radio-communication link
(5) able to understand some MIMO schemes and to quantify their performance in multi-paths contexts

Course Syllabus

- General presentation of array processing: functions, applications
- Array processing for free space propagation: Beamforming, Ambiguities, Shannon
- Array processing for flat fading channels: spatial diversity, MRC receiver, performance
- Array processing for frequency selective channels: MLSE, Zero Forcing and MMSE receivers
- MIMO systems with spatio-temporal coding
- MIMO systems with spatial multiplexing
- MIMO systems with channel state information at transmission

Assessments Methods

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		g	h	i	j	k	f
1. SIMO examination	50	x	x	x	x		
2. MIMO examination	50					x	

Student Study Effort Required

Class contact	
Lecture	21.5 hrs.
Lab exercices	10 hrs.
Other student study effort	
Work on assignments and project; study related material/ team work	
Total student study effort	31.5 hrs.

References

1. D. Tse, P. Viswanath, "Fundamentals of wireless Communications", Cambridge, May 2005.

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SUBJECT TITLE : MULTIMEDIA (MASTER 2)

Objectives

This course aims to give an overview on some applications of multimedia over wireless networks. We give fundamentals information about multimedia content as video, image, and audio streams and the challenges with modern technologies related to user requirements. We study different data compression technologies and the recent associated standards: JPEG 2000, MPEG2, H264 AVC, H264 SVC, and MPEG layer 3. In a further step, we study the characteristics of IP and wireless networks. Finally, we study an example of a scalable video transmission over IP network.

Intended Learning Courses

Upon completion of the subject, students will be:

1. skilled in handling multimedia applications such as streaming stored, streaming live and Real Time interactive of audio and video streams.
2. able to do image compression by removing spatial correlation by using DCT transform.
3. able to use JPEG 2000 standard for image compression,
4. skills in audio signals characterization and different steps for audio compression
5. able to use MPEG layer 3 as standard for audio compression,
6. skills in video sequence characterization: different types of image coding, Intra, Interand Bidirectional image compression in a video sequence. The utility of each type of image coding and its applications.
7. skills in video compression standards : MPEG2, H264 AVC, H264 SVC. Be able to use open source software (in C/C++) of H264 AVC and H264 SVC standards for video compression.
8. skills in wireless and IP networks with different transport protocols.
9. able to know the different steps for video transmission over a multimedia networking system.

Courses Syllabus

 Classes of multimedia applications:

 - streaming stored audio and video,
 - streaming live audio and video,
 - Real Time interactive audio and video
 - Multimedia Compression Fundamentals and Coding Standards Lossless compress,
 - Image compression: JPEG2000,
 - Video compression: MPEG2, H264 AVC, H264 SVC, Audio compression: MPEG Layer 3
 - an overview on IP and wireless networks IP networks characteristics, TCP, UDP, RTP protocols,
 - Study of scalable video H264 SVC transmission over IP wireless network.

Assessments Methods

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		a	b	c	d	e	f
1. Lab exercises	10	x	x	x	x	x	
2. Project	30			x	x	x	x
3. Exam	60						

Required Effort

Class contact	
Lecture	30 hrs.
Lab exercises	10 hrs.
Other student study effort	
Work on assignments and project; study related material / team work	20 hrs.
Total student study effort	60 hrs.

References

- Iain E. Richardson "The H.264 Advanced Video Compression Standard", 2nd Edition Wiley, April 2010
- Van Der Schaar and Philip A. Chou "Multimedia over IP and Wireless Networks. Compression,
- « Networking, and Systems » 1st Edition, Academic Press, Apr 2007.

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SUBJECT TITLE: FRENCH AS A FOREIGN LANGUAGE (MASTER 1 AND 2)

Objectives

At the end of this course, students who have a way stage level in French (A2 of the Common European Framework for Languages) will have an intermediate level (B1 of the Common European Framework for Languages). At this level, students are able to:

- understand the main points of clear standard input on familiar matters regularly encountered in work, university, leisure, etc.
- deal with most situations likely to arise whilst travelling in an area where the language is spoken.
- produce simple connected text on topics which are familiar or of personal interest.
- describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans.

Intended Learning Outcomes

Upon completion of the course, students will be able to:

1. OVERALL ORAL PRODUCTION: reasonably fluently sustain a straightforward description of one of a variety of subjects within his/her field of interest; briefly give reasons and explanations for opinions, plans and actions; generally follow the main points of extended discussion with native speakers; exploit a wide range of simple language to deal with most situations likely to arise whilst travelling; enter unprepared into conversation on familiar topics, express personal opinions and exchange information on topics that are familiar; enter unprepared into conversations on familiar topics.

2. SUSTAINED MONOLOGUE: give a prepared straightforward presentation on a familiar topic within his/her field which is clear enough to be followed without difficulty most of the time; take follow up questions, but may have to ask for repetition if the speech was rapid.

3. OVERALL WRITTEN PRODUCTION: Can write straightforward connected texts on a range of familiar subjects within his field of interest; Can write short, simple essays on topics of interest; summarize, report and give his/her opinion about accumulated factual information on familiar routine and non-routine matters within his/her field with some confidence. Can write personal and formal mails; an take notes as a list of key points during a straightforward lecture, provided the topic is familiar, and the talk is both formulated in simple language and delivered in clearly articulated standard speech.

4. OVERALL LISTENING COMPREHENSION: Can understand straightforward factual information about common every day or job related topics, identifying both general messages and specific details, provided speech is clearly articulated in a generally familiar accent ; follow a lecture or talk within his/her own field, provided the subject matter is familiar and the presentation straightforward and clearly structured. Can understand the main points of radio news bulletins and simpler recorded material about familiar subjects delivered relatively slowly and clearly; follow many films in which visuals and action carry much of the storyline, and which are delivered clearly in straightforward language.

5. OVERALL READING COMPREHENSION: read straightforward factual texts on subjects related to his/her field and interest with a satisfactory level of comprehension; scan longer texts in order to locate desired information, and gather information from different parts of a text, or from different texts in order to fulfil a specific task.

6. INTERCULTURAL HABILITIES: capacity to fulfil the role of cultural intermediary between one's own culture and the foreign culture and to deal effectively with intercultural misunderstanding and conflict situations; the ability to overcome stereotyped relationships.

Subject Syllabus

1. Lexical competence.
2. Grammatical competence.
3. Phonological competence.
4. Orthographic competence.
5. Sociolinguistic competence (politeness conventions, register differences, etc.).
6. Knowledge of the society and culture.

Assessment Methods in Alignment with Intended Learning Outcomes

Continuous assessment with an every week task to do (50 %)
DELF B1 at the end of the semester (50 %)

Student Study Effort Required

Study effort: 2 hours / week

Reading List and References

Learn with online resources: http://langues.cnam.fr/ressources-pedagogiques/travailler-le-fle

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SUBJECT TITLE: INDIVIDUALLY-TAILORED LEARNING PROGRAM IN ENGLISH (MASTER 1 AND 2)

Subject code: ANG001 (1st semester) – 15 weeks – 6 credits/ECTS
ANG002 (2nd semester) – 15 weeks – 6 credits/ECTS
NB: Students can either choose to follow ANG001 or ANG002, or decide to follow both modules

Objectives

Allow students to improve their English skills by working at their own pace and convenience with the help of a personal language coach.

Intended learning outcomes

This program will allow students to:

- Consolidate and expand their general language skills or focus on specialized fields.
- Train for Bulats or other official English tests.
- Focus their language practice on specific needs such as:
  - ✓ Preparing for a job interview
  - ✓ Making presentations
  - ✓ Writing emails
  - ✓ Building confidence on the phone
  - ✓ Understanding scientific journals
  - ✓ Reading the press and/or understanding news reports
  - ✓ Writing reports
  - ✓ Debating

Subject syllabus

A learning program tailored to students' needs

- This personalized learning program is tailored to suit students' specific needs and requirements. It allows students to work at their own pace, either at the Cnam's Language Resource Center or at a location of their choice.
- Students can use a large selection of training material, including those available at the resource center, which can be borrowed for more flexibility.

Personalized guidance and follow-up

- Regular follow-up is ensured by one-to-one sessions with a personal language coach: a total of 5 hours per module is dedicated to helping each student identify his/her language needs, define learning goals, set priorities and assess his/her own progress in learning.
- During each session coach assists student in planning and organizing his/her study-time while providing useful guidance in selecting appropriate learning material and building up learning techniques.
- Between each session student works in autonomy and uses a diary to keep track of all his/her activities, document his/her own learning process and note down all issues which need to be discussed with coach.

The learner's diary is an efficient tool to reinforce students learning skills, as it helps students assess their activity and learning progress and difficulties while working their way through the module.

Language activities and learning materials

- Regular conversation groups with native English speakers and role-play activities are included.
- Varied learning material is provided: self-study course books, articles, recordings, videos, online resources, authentic material such as films and novels.

Student study effort required to validate module

Activity	Minimum	Recommended
One-to-one sessions with coach	5 hours	5 hours
Conversation groups and role play activities	5 hours	10 hours
Personal work	30 hours	40 hours
Total student study effort required	40 hours	55 hours

Assessment methods

Throughout this module, with the help of his personal coach, student will learn how to use various types of exercises to assess his/her own progress in the language and develop self-assessment skills.
Materials such as recordings of his/her speaking production as well as written work can also be used to assess his/her skills and progress.