

<b>COURSE CODE</b>	<b>Eng 633</b>	<b>COURSE LEVEL &amp; YEAR</b>	<b>2<sup>nd</sup> semester</b>																																			
<b>COURSE TITLE</b>	Machine Translation																																					
<b>COURSE TEACHER/S</b>																																						
<b>CREDIT HOURS</b>	3																																					
<b>PRE-REQUISITES</b>																																						
<b>CO-REQUISITES</b>	None																																					
<b>DURATION OF COURSE</b>	16-week semester																																					
<b>TOTAL STUDENT STUDY TIME</b>	3 hours per each contact hour weekly																																					
<b>AIMS</b>	<p>The course serves a number of interrelated objectives. First, it introduces level 2 MA students to the area of machine translation (MT) as a new curricular topic. The course focuses on a number of related sub-topics, including artificial intelligence, machine translation software, and machine translation architectures. Three generations of MT design are briefly reviewed: direct (dictionary-based), rule-based, and corpus-based. The review addresses their mode of functioning, the technical requirements, the capacity, and their respective limitations. Second, the course establishes organic links between machine translation design and the major findings in linguistics (formal semantics, generative syntax, systemic-functional grammar...) which facilitated the emergence of MT projects. This part of the course aims at helping students establish links between the set of traditional linguistic components received in prior courses and their correlative automatic outcomes (i.e. MT design). It consists in a simplified statement on the junction of two disciplines which converge to yield <i>computational linguistics</i>. Third, the course trains students to do basic error analysis. Both human error analysis and automatic error analysis will be introduced in order to allow students to perceive the gap between both models, especially when what is at stake is the assessment of target text structural regularity and communicative readability.</p>																																					
<b>INTENDED LEARNING OUTCOMES</b>	<table border="1"> <thead> <tr> <th></th> <th><b>NQF Learning Domains And Course Learning Outcomes</b></th> <th><b>Course Teaching Strategies</b></th> <th><b>Course Assessment Methods</b></th> </tr> </thead> <tbody> <tr> <td><b>1.0</b></td> <td><b>Knowledge</b></td> <td></td> <td></td> </tr> <tr> <td>1.1</td> <td>Students can theoretically recognize the different machine translation architectures</td> <td>Interactive lecturing (on a weekly basis)</td> <td rowspan="5">a. End of chapter written quizzes b. Oral participation c. Home assignments d. Research paper e. Project work f. PowerPoint presentation g. Midterm testing h. Final examination</td> </tr> <tr> <td>1.2</td> <td>Students can recognize the different machine translation architectures through examining their outputs</td> <td>Tutorial work to allocate translation outputs to their respective architectures</td> </tr> <tr> <td>1.3</td> <td>They can identify the contribution of certain findings in formal linguistics to the emergence of machine translation systems/programs</td> <td>Lectures Classroom discussion</td> </tr> <tr> <td>1.4</td> <td>They can compare human with automatic translation by using quantitative criteria</td> <td>Pair work Contrastive methodology</td> </tr> <tr> <td>1.5</td> <td>They can describe charts/graphs representing the different machine translation architectures</td> <td>PowerPoint presentations Audiovisual data</td> </tr> <tr> <td><b>2.0</b></td> <td><b>Cognitive Skills</b></td> <td></td> <td></td> </tr> <tr> <td>2.1</td> <td>Students will be able to differentiate different machine translation outputs and categorize them into distinct architecture</td> <td>Intensive drilling in contrastive work External assistance</td> <td rowspan="2">a. End of chapter written quizzes b. Oral participation c. Home assignments</td> </tr> <tr> <td>2.2</td> <td>They will be able to diagram the three</td> <td>Tutorial exercises on</td> </tr> </tbody> </table>				<b>NQF Learning Domains And Course Learning Outcomes</b>	<b>Course Teaching Strategies</b>	<b>Course Assessment Methods</b>	<b>1.0</b>	<b>Knowledge</b>			1.1	Students can theoretically recognize the different machine translation architectures	Interactive lecturing (on a weekly basis)	a. End of chapter written quizzes b. Oral participation c. Home assignments d. Research paper e. Project work f. PowerPoint presentation g. Midterm testing h. Final examination	1.2	Students can recognize the different machine translation architectures through examining their outputs	Tutorial work to allocate translation outputs to their respective architectures	1.3	They can identify the contribution of certain findings in formal linguistics to the emergence of machine translation systems/programs	Lectures Classroom discussion	1.4	They can compare human with automatic translation by using quantitative criteria	Pair work Contrastive methodology	1.5	They can describe charts/graphs representing the different machine translation architectures	PowerPoint presentations Audiovisual data	<b>2.0</b>	<b>Cognitive Skills</b>			2.1	Students will be able to differentiate different machine translation outputs and categorize them into distinct architecture	Intensive drilling in contrastive work External assistance	a. End of chapter written quizzes b. Oral participation c. Home assignments	2.2	They will be able to diagram the three	Tutorial exercises on
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2	different machine translation architectures (e.g. Vauquois Triangle)	visual data representation (manual and computerized graphic design)	d. Research paper e. Project work f. PowerPoint presentation g. Midterm testing h. Final examination
2.3	They can rate the quality of machine translation output quantitatively	Tutorial work on Translation Quality assessment (Williams' model)	
2.4	They can compare human translation output with machine translation output quantitatively	Pair work Classroom discussion	
2.5	They can estimate the deficiency of certain machine translation architectures with a given text type	Demonstration (online videos)	
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	Students are trained to assume responsibility for performing their library search tasks and project work independently	Demonstration (online videos)	a. End of chapter written quizzes b. Oral participation c. Home assignments d. Research paper e. Project work f. PowerPoint presentation g. Midterm testing h. Final examination
3.2	They are taught how to cope with unexpected logistic breakdowns (e.g. software failure, manual troubleshooting ...)	Tutorial exercises Intensive drilling	
3.3	Students are encouraged to contact experts in automatic translation, artificial intelligence, and MT architecture at the Information and Computer Science College next door	Mentoring External assistance (public relations)	
3.4	Students are also encouraged to attend seminars, workshops, and training sessions specialized in machine translation and corpus-based translation studies	Mentoring Forming a mini-network for MA group interaction via social networks to exchange data and information on events	
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	Students are encouraged to receive periodic training in computer literacy to be able to manipulate electronic tasks (e.g. online translation engines, Translation memory System [e.g. TRADOS])	Intensive drilling Demonstration (online videos) External assistance	a. End of chapter written quizzes b. Oral participation c. Home assignments d. Research paper e. Project work f. PowerPoint presentation g. Midterm testing h. Final examination
4.2	They become familiar with predictable system errors associated with certain translation engines	Lectures Demonstration (online videos)	
4.3	They can evaluate the performance of the machine translation architectures covered in the course (e.g. the poor performance of example-based systems with below standard corpus size)	Intensive drilling Demonstration (online videos) External assistance	
4.4	Students practice the routine activities of installing, uninstalling,	Intensive drilling Demonstration (online	

	troubleshooting frequently used automatic translation packages	videos) External assistance	
<b>5.0</b>	<b>Psychomotor</b>		
5.1	Students will be able to manipulate machine translation software		Focused quizzes on how demonstrate how to operate the system and get optimal results (e.g. TRADOS translation memory system)
5.2	They learn how to transform theoretical data into visual design through drawing graphs/charts		Quiz test

#### LEARNING/TEACHING METHODS

#### ASSIGNMENTS

**List the frequency and type of formative (non-assessed) assignments given over the duration of the course.**

Assignments are varied. They include:

- library-related assignments
- online-related assignments
- oral classroom presentations/talks
- research papers

#### ASSESSMENT

#### 5. Schedule of Assessment Tasks for Students During the Semester

N°	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Assessment
1	End-of-chapter quiz n° 1	2	5
2	End-of-chapter quiz n° 2	4	5
3	End-of-chapter quiz n° 3	7	5
4	Midterm Test	8	25
5	End-of-chapter quiz n° 4	9	5
6	End-of-chapter quiz n° 11	11	5
7	Research paper due:	13	5
8	Presentations	15	5
9	Final Exam	16	60

#### SYLLABUS PLAN

1. Topics to be Covered		N° of Weeks	Contact hours
1.	<ul style="list-style-type: none"> <li>▪ Introduction: Ice-breaking</li> <li>▪ Preliminary Introduction to Machine Translation (MT): History &amp; Types</li> </ul>	1	3
2.	Overview of Machine Translation Packages: Characteristics and Functions	1	3
3.	The Contribution of Linguistics to Machine Translation Design (a): e.g. formal semantics, generative syntax...	1	3
4.	The Contribution of Linguistics to Machine Translation Design (b): e.g. systemic-functional theory, lexical decomposition...	1	3
5.	Machine Translation Tools & Resources: e.g. electronic dictionaries, termbase...	1	3
6.	Introduction to Machine Translation Architectures	1	3
7.	Machine Translation Architectures: The Direct Approach	1	3
8.	Machine Translation Architectures: The Rule-based Approach (a): Transfer	1	3

9.	Machine Translation Architectures: The Rule-based Approach (b): Interlingua	1	3
10.	Machine Translation Architectures: The Corpus-based Approach (a): Statistics B.	1	3
11.	Machine Translation Architectures: The Corpus-based Approach (b): Example B.	1	3
12.	Machine Translation Architectures: The Hybrid Model	1	3
13.	Error Analysis	1	3
14.	Student Presentations (a)	1	3
15.	<ul style="list-style-type: none"> <li>• Student Presentations (b)</li> <li>• Q &amp; A time (general revision)</li> </ul>	1	3
Final Exam (written)		1	2.5

#### INDICATIVE BASIC READING LIST

- a. **List text books and main supporting reference works.** Quah, C. K. (2006). *Translation and technology*. New York: Palgrave Macmillan.
- b. Hutchins W. J. and Somers H. (1992). *An introduction to machine translation*. Academic Press: Harcourt Brace Jovanovich Publishers.

List Essential Reference Materials (Journals, Reports, etc.)

Arnold, Douglas; Balkan, Lorna; Meijer, Siety, Humphreys, R. Lee; and Sadler, Louisa (eds.). (2001). 2<sup>nd</sup> ed. *Machine translation: An introductory guide*. Blackwell.

Hutchins W. J. and Somers H. (1992). *An introduction to machine translation*. Academic Press: Harcourt Brace Jovanovich Publishers.

Quah, C. K. (2006). *Translation and technology*. New York: Palgrave Macmillan.

Wilks, Yorick. (2009). *Machine translation: Its scope and limits*. Sheffield: Springer.

List Recommended Textbooks and Reference Material (Journals, Reports, etc)

Arnold, Douglas; Balkan, Lorna; Meijer, Siety, Humphreys, R. Lee; and Sadler, Louisa (eds.). (2001). 2<sup>nd</sup> ed. *Machine translation: An introductory guide*. Blackwell.

Chiang, D. (2005). "A Hierarchical Phrase-Based Model for Statistical Machine Translation." In *Proceedings of the 43rd Annual Meeting of the Association for Computational Linguistics (ACL'05)*.

Fraser, Alexander. (2007). Improved word alignments for statistical machine translation. ProQuest Information and Learning Company

Goutte, Cyril, (ed.). (2009). *Learning machine translation*. Massachusetts: MIT Press.

Hauenschild, Christa (ed.) et al. (1997). *Machine translation and translation theory*. Berlin: Mouton De Gruyter.