LT3222: MACHINE TRANSLATION

Effective Term
Semester B 2022/23

Part I Course Overview

Course Title
Machine Translation

Subject Code
LT - Linguistics and Translation
Course Number
3222

Academic Unit
Linguistics and Translation (LT)

College/School
College of Liberal Arts and Social Sciences (CH)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
(i) LT2231 Introduction to LanguageTechnology and (ii) LT2201 Introduction to Linguistics or LT2229 Fundamentals of Linguistics or LT2290 Introduction to Language Studies

Precursors
LT3233 Computational Linguistics

Equivalent Courses
CTL3222 Machine Translation

Exclusive Courses
Nil

Part II Course Details

Abstract

The aim of this course is to study the roles of computers and information technology, linguistic knowledge and translation expertise in the automation of translation and examine the possibilities of integrating the best of human and machine intelligence to maximize translation productivity.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the major events in machine translation (MT) technology development	30	x	x	
2	Apply linguistic knowledge competently and creatively to explore the key tasks of language processing involved in MT	30	x	x	x
3	Evaluate machine translation systems competently and creatively in terms of both system implementation and translation quality	20	x	x	x
4	Describe the recent trends of MT technology development	20	x	x	

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

	TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1		Lectures towards the above outcomes to explain and illustrate the basic issues involved and necessary programming techniques, if applicable, for a practical solution for each of them; it may involve quizzes on knowledge points, discussion of issues of students' interest and/or demos of available technologies.	1, 2, 3, 4	3 hours

2		Readings of lecture notes and selected chapters from textbooks	1, 2, 3, 4	
3		Implementing a prototype MT system for a controlled language	1, 2, 3, 4	
4		Canvas – Canvas and email will be used as a forum for further communication among teachers and students concerning the course	1, 2, 3, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignments to design and implement (the kernel part of) the programs for the above tasks;	1, 2, 3, 4	50	
2	Demos of running programs in tutorials;	1, 2, 3, 4		
3	Quizzes (optional)	1, 2, 3, 4		

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Assessment Rubrics (AR)

Assessment Task

1. Assignments

Criterion

Knowledge, attitude, ability, creativity, accomplishment and performance in completing and/or presenting demons and/or assignments

Excellent (A+, A, A-)

Excellent knowledge of major issues, concepts, principles and techniques in various approaches to machine translation. Excellent, creative application of linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Very active participation and high marks/ performance.

Good (B+, B, B-)

Good knowledge of major issues, concepts, principles and techniques in various approaches to machine translation. Good application of linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Active participation and good marks/ performance.

Fair (C+, C, C-)

Adequate knowledge of major issues concepts, principles and techniques in various approaches to machine translation. Fair application of linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Adequate participation and fair marks/ performance.

Marginal (D)

Basic familiarity with the subject matter. Marginal ability to apply basic linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Marginal participation and marginal marks/ performance.

Failure (F)

Poor familiarity with the subject matter. Poor ability or fail to apply linguistic, computing and programming knowledge to basic language processing subtasks machine translation.Poor participation and poor marks/ performance.

Assessment Task

2. Demos of running programs

Criterion

Knowledge, attitude, ability, creativity, accomplishment and performance in completing and/or presenting demons and/or assignments

Excellent (A+, A, A-)

Excellent knowledge of major issues, concepts, principles and techniques in various approaches to machine translation. Excellent, creative application of linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Very active participation and high marks/ performance.

Good (B+, B, B-)

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Failure (F)

Poor familiarity with the subject matter. Poor ability or fail to apply linguistic, computing and programming knowledge to basic language processing subtasks machine translation. Poor participation and poor marks/ performance.

Assessment Task

3. Quizzes

Criterion

Marks

Excellent (A+, A, A-)

Excellent knowledge of major issues, concepts, principles and techniques in various approaches to machine translation. Excellent, creative application of linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Very active participation and high marks/ performance.

Good (B+, B, B-)

Good knowledge of major issues, concepts, principles and techniques in various approaches to machine translation. Good application of linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Active participation and good marks/ performance.

Fair (C+, C, C-)

Adequate knowledge of major issues concepts, principles and techniques in various approaches to machine translation. Fair application of linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Adequate participation and fair marks/ performance.

Marginal (D)

Basic familiarity with the subject matter. Marginal ability to apply basic linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Marginal participation and marginal marks/ performance.

Failure (F)

Poor familiarity with the subject matter. Poor ability or fail to apply linguistic, computing and programming knowledge to basic language processing subtasks machine translation. Poor participation and poor marks/ performance.

Assessment Task

4. Examination

Criterion

Marks

Excellent (A+, A, A-)

Excellent knowledge of major issues, concepts, principles and techniques in various approaches to machine translation. Excellent, creative application of linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Very active participation and high marks/ performance.

Good (B+, B, B-)

Good knowledge of major issues, concepts, principles and techniques in various approaches to machine translation. Good application of linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Active participation and good marks/ performance.

Fair (C+, C, C-)

Adequate knowledge of major issues concepts, principles and techniques in various approaches to machine translation. Fair application of linguistic, computing and programming knowledge to basic language processing subtasks in machine translation. Adequate participation and fair marks/ performance.

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Part III Other Information

Keyword Syllabus

History of machine translation. Generations of MT technology. Language analysis, transfer and generation. NLP technologies involved in MT: Sentence splitting/identification, tokenization and word segmentation; lemmatization; part-of-speech tagging; parsing; semantic and discourse analysis; sentence generation.

Text alignment and language resource acquisition. MT evaluation. Recent advances in MT technology: translation memory, example-based machine translation, statistical-based machine translation.

Reading List

Compulsory Readings

	Title
1	Lecture notes/slides for the course
2	Selected papers/chapters on topics of machine translation
3	Selected tutorials on key tasks of programming for system implementation
4	Philipp Koehn. 2020. Neural Machine Translation. Cambridge University Press.
5	Tong Xiao & Jingbo Zhu. 2021. Machine translation: Statistical modeling and deep leaning methods. Electronic Industry Press, China. https://github.com/NiuTrans/MTBook

Additional Readings

	Title
1	Relevant chapters in the recommended reading list
2	Advanced and/or related topics of programming for system implementation
3	Philipp Koehn. 2011. Statistical Machine Translation. Cambridge University Press.