

Moderate Degree Change Proposal Checklist

Comments in bold and italics indicate either section or topic is covered in narrative guidance.

Part A Fundamental Information Required for all Moderate Degree Change Proposals

Answers to the following will be provided as a cover sheet to the proposal

1 Institution Name: University of Washington

2 Institutional Endorsement of Moderate Degree Change Proposal by Chief Academic Officer



Gerald J. Baldasty

Vice Provost and Dean of the Graduate School

3 Contact Information

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4 Degree Title Change

Current title (pre-change): MASTER OF ARTS (COMPUTATIONAL LINGUISTICS)

Proposed title (post-change): MASTER OF SCIENCE (COMPUTATIONAL LINGUISTICS)

Start date(s) for new degree(s): Autumn quarter 2011

End date(s) for old degree(s): Summer quarter 2010

5 Type of Change Requested

X Conversion of eligible options, specializations, or concentrations into majors or degrees

Consolidation of two or more eligible degrees into a single new degree

Change in level of an eligible program's degree designation

Other: Change of degree type

Note: "Other" changes need to be accompanied by a formal written exception request

Form 11 Questions that should be responded to in narrative form or provided as an appendix to proposal

6 Rationale for Treatment of Change as a Moderate Degree Change — Discuss in section 1

Why should the proposed degree change be categorized as a moderate degree change rather than a change requiring a full proposal for a new degree program?

7 Accreditation — **Discuss the following in section 2 if program is professionally accredited or such accreditation is available.**

7a What kind of program-specific accreditation is available?

7b What program-specific accreditation has been obtained or will be obtained, and when? (If program-specific accreditation is available but will not be obtained, explain.)

7c How will the proposed program change affect program-specific accreditation? (For example, will the program's accreditation change? Will the program change allow the program to retain its existing accreditation?)

8 Other Basic Information —

8a Degree granting unit . Include past name if changing.

Department of Linguistics

8b CIP code. Include old code if changing.

160102

8c Indicate any new concentrations, option or specialization and, if applicable, changes to those existing.

No new concentrations

8d Indicate whether location(s) and mode(s) of delivery are changing .

Note: Changes in location or addition of distance delivery must be accompanied by a Location Notification of Intent (LNOI).

8e Indicate whether scheduling (day, evening, weekend) and attendance options (full-time, part-time) are changing.

No changes, but both full-time and part-time study are allowed.

8f Have any of the programs involved in the change been involved in a Moderate Degree Change Proposal (MDCP)?

No

9 Short Form Questions for Externally Mandated Changes — **Discuss in section 2 if proposed change is in response to mandate by an accrediting agency or other body.**

9 a The institution certifies that the proposed change is mandated by an external accrediting, licensing, or other regulatory authority and that the proposed change will not affect the program's degree level, curriculum, or faculty, and will not have an adverse impact on any student's learning experience.

<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
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9b (For changes in degree level only.) Is the change in degree level externally mandated?

<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
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10 Rationale for Change — **Discuss Bullets 1 & 2 in Section 1; discuss Bullets 3-5 in Section 2**

Provide a rationale for making the proposed change at the proposed time, including:

- An overview describing the proposed change (including what is changing and why).

- A history of relevant, existing, pre-change programs and a description of how they have evolved over time.
- A description of how the change will benefit students and employers in the changing workplace.
- A description of the community need for the proposed moderate degree change.
- A description of how the proposed change will align with or help implement the Statewide Strategic Master Plan for Higher Education.

11 Projected Enrollment — ***Discuss in Section 5***

Year 1 (2011-2012) FTE: 35

Full Enrollment (2011-2012) FTE: 35

12 Cost of Change — ***Discuss in Section 7***

13 Evidence of Student and Employer Need – ***Discuss in Section 3***

13a Name of Pre-Change program and Enrollment and Graduation Statistics

13b What percentage of program graduates, on average, pursues higher degrees after graduation (if available)?

13c What percentage of program graduates, on average, obtains employment appropriate to their training (if available)?

13d Provide other evidence of student and employer need, if appropriate (for example, if the data requested in 13a-13c may not be a good indicator of future need).

13e If the proposed change involves a degree level change that is not externally mandated, provide additional evidence for student and employer need for degrees at the post-change degree level. The additional evidence must be similar to that which would be provided in a full proposal for a new degree.

14 Pre to post-change comparisons — ***Discuss in Section 5 except where a different section is suggested.***

14a Target student audience

14b Admission requirements

14c Learning objectives

14d Normal time to graduate

14e Faculty — ***Discuss in Section 6***

14f If faculty will change for new degree, include program faculty table in narrative

14g Facilities — ***Discuss in Section 7***

14h Curriculum

Include curriculum change table in narrative

15 Internal Analysis — ***Discuss in section 1***

16 External Review including reviewer biography

External reviewers will be contacted by the appropriate staff based on recommendations from the proposing unit. Depending on their relevance, external review materials from unit's academic review may be used.

Section 1: Rationale for Proposed Change

The Professional Master's Program in Computational Linguistics (CLMA) began in 2005, and granted its first degrees in 2006. The program was initially established as a concentration within the existing Masters of Arts degree offered by the Department, as it matches other MA degrees (in General Linguistics and Romance Linguistics) offered by the Department in form, viz., the number of courses, number of credits, and the MA project. The two concentrations originally shared over half of their curricula in terms of underlying linguistic principles. However, the computational linguistics track as implemented is significantly different in content (the focus of particular courses required, most of which have been developed specifically for this degree concentration), in its prerequisites (programming and statistics), and in the availability of the internship option to fulfill the Masters project requirement.

Our program prepares students for careers in a highly technical field. We have placed graduates with such employers as Microsoft, Google, Cisco, and Pacific Northwest National Labs. Especially in the current job market, the title of the degree is important in helping graduates get their foot in the door. The current situation, in which the name of the Master of Arts degree title does not properly match its content, puts our graduates at a disadvantage.

There are very few programs in the US which offer a specialized degree in Computational Linguistics (as opposed to a specialization within a degree in Computer Science or Linguistics). We are currently aware of three: Master of Science programs at Carnegie Mellon University and the University of Arizona and a Master of Arts program at Indiana University.

- Carnegie Mellon University (Language Technologies Institute)

<http://www.lti.cs.cmu.edu/MS/>

- University of Arizona (Department of Linguistics)

<http://hlt.arizona.edu/program/curriculum.php>

- University of Indiana (Department of Linguistics)

<http://jones.ling.indiana.edu/~cl/2/2.html#MAtrack>

Our curriculum is most similar to that of the University of Arizona program in terms of the particular courses offered. More generally, we are like both the University of Arizona program and the Carnegie Mellon program and unlike the MA program at the University of Indiana in requiring many programming-intensive courses and requiring prior background in computer science as a prerequisite to those courses.

Within UW, our program is comparable to the iSchool's Master of Science in Information Management and HCDE's Master of Science in Human Centered Design and Engineering. The similarities we see are in

the integration of computational methods with previously non-computational disciplines. In addition, we believe our courses to require at least the same degree of technical skills and hands-on technical work as these three two MS programs.

- iSchool MSIM:

http://ischool.uw.edu/msim/prospective/curriculum?quicktabs_4=0

- HCDE:

<http://www.hcde.washington.edu/nav-prog-advise/pmp/curriculum/cos>

The Department of Linguistics is currently in the process of carrying out a 10-year review, the previous one having been done in 1999-2000. The CLMA program is being reviewed as part of this departmental review. It was not reviewed in the previous 10-year review, but in fact is an outcome of that departmental review which suggested that the department expand its offerings to include Computational Linguistics. In addition, the CLMA program has its own advisory board, which meets annually to provide feedback on the current state of the program and assist us in keeping up with industry trends. The advisory board has suggested that we seek this reclassification.

In addition to the CLMA faculty, other individuals involved with this proposed change are the Department Chair (Prof. Julia Herschensohn) and Dr. Erik Bansleben of Professional and Continuing Education which jointly administers the program.

Section 2: Accreditation

There are no mechanisms for accreditation in the field of Computational Linguistics.

Section 3: Student, Employer and Community Need

The CLMA program was launched in 2005 in response to employer need for graduates trained in Computational Linguistics. The program has been successful in fulfilling this need, graduating 44 students to date and placing students in jobs with employers such as Microsoft, Google, Cisco, Pacific Northwest National Labs as well as many smaller companies including start-ups. However, the MA designation currently on the degree does not serve our students well. Especially in the current highly competitive job market, our students often find that their resumes are discarded without being read because of the name of the degree. Indicating the technical nature of the program on the resumes does not suffice to address this if employers aren't actually reading them.

The CLMA program as a whole helps to implement the Statewide Strategic Master Plan for Higher Education in several ways: (i) By serving a population of re-entry students, it promotes life-long learning, (ii) It expands educational offerings in a field with high demand and few degree programs, (iii) It promotes student enrollment in a STEM field, and (iv) By supporting two tenure-track faculty lines and by involving graduate students in faculty research, it expands research capacity. The proposed change of the degree from MA to MS will enhance the program's ability to implement these goals. An MS degree will be more useful to our graduates and will therefore likewise attract more students. One of the most commonly asked questions at info-sessions for this degree program is why we grant an MA rather than an MS and if

that will have any implications for students on the job market. Furthermore, the MS designation for the program will make it easier for us to access sources of support for students in STEM fields. The table below gives enrollment and graduation statistics for the CLMA program.

Enrollment and Graduation Statistical History

	Academic Year	Total # of Applicants	# of Qualified Applicants (If available)	# of Admission Offers (If available)	Total Enrollment (Headcount)	# of Graduates (Headcount)	Job Placement Rate (If available)
Current Year	10-11	40	30	27	21	2	n/a
1 Year Ago	09-10	58	53	53	48	13	75%
2 Years Ago	08-09	35	27	27	19	10	83%
3 Years Ago	07-08	45	39	39	27	8	100%
4 Years Ago	06-07	45	42	42	29	10	80%
5 Years Ago	05-06	36	33	33	23	0	n/a

Notes: 10-11 was the first year for which we instituted a wait list. In all previous years, we offered admission to all qualified applicants. Many of our students are already employed when they join the program and continue in their positions after graduating. Neither these students nor those who go on to PhD programs are included in the job placement rate calculations. Five students so far have gone on to PhD programs, two at UW and three elsewhere.

Section 4: Curriculum

We are not proposing a curriculum change, but rather a change in the degree designation for the present curriculum. The program was initially established as a concentration within the existing Masters of Arts degree offered by the Department, as it matches other MA degrees (in Linguistics and Romance Linguistics) offered by the Department in form, viz., the number of courses, number of credits, and the MA project. However, it is significantly different in content. This section will describe those differences and highlight the aspects of the curriculum which motivate the change from Masters of Arts to Masters of Science.

The coursework components of the Professional Masters in Computational Linguistics and the General Linguistics MA are summarized and contrasted in the table below:

<i>Professional Masters in Computational Linguistics</i>	<i>Masters of Arts in General Linguistics</i>
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Shared	Shared
Intro to Linguistics Phonetics (Ling 550)	Linguistics 550 (Intro to Linguistic Phonetics)
Partially shared	Partially shared
One course in Syntax (Ling 566, Intro to Syntax for Computational Linguistics)	Two courses in Syntax (typically Ling 507 and 508, Syntactic Theory I, II)
One Linguistics elective (drawn from general Linguistics curriculum)	Three electives, of which at least two must be 500-level courses with research papers or projects (may draw from Computational Linguistics courses)
Not shared	Not shared
Shallow Processing Techniques for Natural Language Processing (Ling 570)	One more course in Phonetics/Phonology
Deep Processing Techniques for Natural Language Processing (Ling 571)	One course in Semantics
Advanced Statistical Methods in Natural Language Processing (Ling 572)	One course in Sociolinguistics
Natural Language Processing Systems/Applications (Ling 573)	
Computational Linguistics elective (typically Ling 575 Topics in Computational Linguistics or Ling 567 Knowledge Engineering for Deep Linguistic Processing)	
Computational Linguistics or related fields elective	

In summary, there are minimally two courses of overlap between the two programs (Ling 550 and the Linguistics elective in the CLMA program). The maximal overlap would be five courses, if a General Linguistics student took Ling 566 for one of Syntax courses and then Computational Linguistics courses for all three electives.

Of the courses specific to the CLMA program, the four core courses (Ling 570-573) as well as many of the elective courses include an intensive programming component. In the core courses, students complete weekly homework assignments which all involve programming and, in many cases, involve building a complex software system across several weeks or most of the quarter. These courses also emphasize evaluation of the resulting systems according to the current norms of our field (held-out test data, comparison to baselines and the state of the art, standard evaluation metrics). The Computational Linguistics and related fields electives again almost always involve hands-on projects with substantial computer programming and similar evaluation emphases as the core courses. Topics of recent elective offerings include "NLP for Mobile Devices" (2010 and 2011), "Introduction to Speech Technology" (2009 and 2011), and "Information Extraction in the Medical Domain" (2010). A list of recently offered electives can be found at: <http://compling.uw.edu/courses/electives.asp>

There are curricular differences beyond the coursework as well. While both programs require an MA project, in the General Linguistics MA program this is always satisfied with a thesis. In contrast, CLMA students may do a thesis, an internship with an associated writing assignment, or a non-thesis project (again with an associated writing assignment). The full details of these options are documented here:

http://depts.washington.edu/uwcl/clma/thesis_option.html
http://depts.washington.edu/uwcl/clma/internship_option.html
http://depts.washington.edu/uwcl/clma/project_option.html

Students taking the internship option have done internships with companies including Google, Cisco Systems, Microsoft, PriceWaterhouseCoopers, PARC, and several smaller tech firms. Likewise, students who do the project option do programming-heavy projects on campus. Our standard for a thesis is that it should be suitable as a conference presentation in our field, and indeed, CLMA theses have formed the basis of papers presented at the Association for Computational Linguistics (ACL) and COLING (International Conference on Computational Linguistics), among other venues. These conferences bring together scholars from research labs in industry (Google, Microsoft, IBM, and others) with scholars from academia, largely from Computer Science and Electrical Engineering departments.

Finally, while the General Linguistics MA students are required to pass a foreign language exam, this is satisfied for the CLMA students with the programming languages inherently tested by the Computational Linguistics course work.

Though we are not proposing changes to the curriculum at this time, we include Table 2 filled in with the current curriculum for completeness.

Table 2: Master of Science (Computational Linguistics) Curriculum

Required Courses		
Course Number		Credits
Ling 550 (or 450)	Introduction to Linguistic Phonetics	5
Ling 566	Introduction to Syntax for Computational Linguistics	3
Ling 570	Shallow Processing Techniques for Natural Language Processing	4
Ling 571	Deep Processing Techniques for Natural Language Processing	4
Ling 572	Advanced Statistical Methods for Natural Language Processing	4
Ling 573	Natural Language Processing Systems and Applications	4
Ling 700 or 600	Master's Thesis/Independent Study or Research	10
Total Required Credits		34
Elective Courses		

Ling 575	Topics in Computational Linguistics	3
Ling 567	Knowledge Engineering for Deep Linguistic Processing	3
Etc.	(Other electives drawn from Linguistics outside of Computational Linguistics, as well as CSE, the iSchool, and other departments. A list can be found here: http://depts.washington.edu/uwcl/clma/approved_electives.html)	3-5
Total Elective Credits		9
Total Credits in Program		43

Section 5: Student Enrollment and Impacts

Our capacity is 35-40 FTE, but as we have many part-time students, there are often more than 60 students enrolled in the program at any given time. The following table provides FTE enrollment numbers for the past few years:

2006-07			2007-08			2008-09			2009-10			2010-11
Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter	Spring	Fall
24	17	17	32	23	20	20	20	21	44	42	37	35

Our target student audience consists of (a) software professionals interested in returning to school to expand their expertise into Computational Linguistics, (b) recent graduates of CS programs with an interest in Natural Language Processing, and (c) recent graduates of Linguistics programs with demonstrated aptitude for Computer Science interested in computational approaches to and applications of Linguistics. The prerequisites are as follows:

- The ability to program, including:
 - Knowledge of data structures and algorithms (equivalent to [CS 373](#) at UW)*
 - Broad familiarity with C++ and Java
 - Expertise in C++ or Java
 - Perl and/or Python are recommended
- A college-level introductory course in linguistics or equivalent
- Introduction to statistics and probability (equivalent to [STAT 391](#) at UW)*
- Some knowledge of languages other than English is strongly encouraged

Applicants who have not taken data structures and algorithms or statistics and probability may complete one of these courses while in the program by taking CS 373 or STAT 391 at the UW. This option will be subject to the availability of appropriate courses.

The CLMA program has the three following general learning goals. By the end of the program, CLMA students will:

- learn to think like a computational linguist
- understand the state of the art in Computational Linguistics
- understand the potential contributions of both machine learning and knowledge engineering to applications of Computational Linguistics

The normal time to graduate varies depending on whether the student fulfills the master’s project requirement with an internship, project or thesis, and whether the student is full time or part time. We have the following scenarios:

- Full time study (requires meeting all prerequisites before enrolling), internship option: 4 quarters
- Full time study (requires meeting all prerequisites before enrolling), thesis option: 5-6 quarters
- Part time study (fulfilling requirements along side), internship or thesis option: 8-10 quarters
- Part time study (one course at a time while working full time), internship or thesis option: 12-15 quarters

Section 6: Faculty

The three primary faculty in the program are Emily Bender (Associate Professor, Linguistics and Faculty Director, CLMA), Fei Xia (Assistant Professor, Linguistics and Acting Faculty Director, CLMA, 12/16/10-6/15/11) and Gina-Anne Levow (Assistant Professor, Linguistics). Among them, they teach the core courses and most of the Computational Linguistics electives and supervise most of the Master’s projects. Linguistics 550 is usually taught by Richard Wright (Associate Professor, Linguistics) or Alicia Wassink (Associate Professor, Linguistics). In addition, we have one to three “guest” electives taught each year (Ling 575: Topics in Computational Linguistics). These have been taught by faculty from other units (e.g., Katrin Kirchhoff, Associate Research Professor, EE) as well as computational linguists working in industry (e.g., William Lewis and Kristina Toutanova from Microsoft Research).

Table 3: Faculty FTE changes (*Table 14.1 on HECB Form 11*)

Number of FTE Provided for Program(s) by:	Pre-Change	Post-Change
	# of FTE	# of FTE
Full-Time Tenure-Track Faculty with Highest Degree at:		
Doctoral Level	3	3
Master’s Level		
Other (describe other degrees or qualifications)		
Full-Time Non-Tenure-Track Faculty with Highest Degree at:		

<p>Doctoral Level</p> <p>Master's Level</p> <p>Other (describe other degrees or qualifications)</p>		
<p>Part-Time Faculty with Highest Degree at:</p> <p>Doctoral Level</p> <p>Master's Level</p> <p>Other (describe other degrees or qualifications)</p>		
Total FTE for program(s)	3	3

Section 7: Impact on Budget and Facilities

The CLMA program is a self-sustaining degree program jointly administered by UW Professional and Continuing Education and the Department of Linguistics. The program supports two tenure-track faculty lines, one 100% FTE system administrator for the instructional laboratory, one 50% FTE program coordinator, and one 5% FTE administrator. Beyond these costs, the program budget also supports lab equipment (the server cluster that students use for coursework and research projects), 6 quarters of TAship, and program-internal scholarships (1/3 of total program cost for 4 students in 2010-2011). Net revenues after these costs and various overhead charges are returned to the Department of Linguistics. Net revenues for 2009-2010 were \$362,000.

Section 8: External review

The proposed external reviewers are the external members of our department's 10 year review committee:

- Mary E. Beckman, Professor, Department of Linguistics, The Ohio State University
PhD, Linguistics, Cornell University, 1984
- Richard P. Meier, Chair and Professor, Department of Linguistics, University of Texas at Austin
PhD, Linguistics, University of California, San Diego, 1982

The internal members of the department review committee are:

- Lynne A. Werner, Professor, UW Speech & Hearing Sciences (Committee Chair)
- Steven L. Tanimoto, Professor, UW Computer Science and Engineering

There are no conflicts of interest with any of these committee members.

From: Mary E. Beckman, Professor, Department of Linguistics, Ohio State University
Richard P. Meier, Professor & Chair, Dept. of Linguistics, University of Texas at Austin
To: Washington State Higher Education Coordinating Board
Re: Proposed moderate degree change, Master of Arts in Computational Linguistics
Date: March 14, 2011

As part of the Review Committee for a regular 10-year program review of the Department of Linguistics, we reviewed the Master of Arts in Computational Linguistics (CLMA) and assessed the proposed moderate degree change in the type of the degree to a Master of Science in Computational Linguistics (CLMS). In making this assessment, we compared the current CLMA to two other programs that seem most similar to it: (1) the Master of Science in Human Language Technology, offered by the Department of Linguistics, University of Arizona, and (2) the Master of Science in Language Technologies, offered by the School of Computer Science, Carnegie Mellon University.

The current CLMA at the University of Washington is a professional degree that was established in 2005, and that produced its first graduate in 2006. Like the two comparison programs, the CLMA at UW is a program that is designed first of all to prepare students for careers in a highly technical field, Computational Linguistics (CL). The program requirements include a sequence of required courses and electives, culminating in successful completion of a mentored project or a thesis demonstrating mastery of the skills and knowledge relevant for a career in developing speech and language technology. The courses are challenging. Even the introductory courses require prior skills in computing. (The Department also offers a series of prerequisite courses leading toward a certificate of competence in these background skills, which students who do not have the full required background can take. These courses do not count toward the degree.) The evaluation via the project or thesis is appropriately rigorous.

The faculty have been extremely responsive to student needs for flexibility and distance learning options, and the placement record after graduation is very good. This makes the UW program unique in its combination of flexibility and rigor. The program has a strong history of placement of graduates with industrial employers such as Microsoft and Google. Other graduates have used their degrees to gain admission to highly competitive doctoral programs. These include departments of computer science such as the one at CMU. In their proposal to change the degree type, the CL faculty argue that, "Especially in the current job market, the title of the degree is important in helping graduates get their foot in the door. The current situation, in which the name of the Master of Arts degree title does not properly match its content, puts our graduates at a disadvantage." We concur with this assessment, noting that the change in title would also be better match for graduates who are applying for doctoral programs in computer science. Thus, we deem a change in title highly appropriate and endorse the proposal.



Mary E. Beckman, Ph.D.
Professor of Linguistics
The Ohio State University



Richard P. Meier, Ph.D.
Professor & Chair of Linguistics
University of Texas at Austin