Centre for Transdisciplinary Studies
Dr. Bhimrao Ambedkar University, Agra

Date: June 16, 2020

Minutes of the First Academic Committee Meeting of the M.Sc. in Computational Linguistics program at the Centre

A meeting of the Academic Committee of the M.Sc. in Computational Linguistics program at the Centre for Transdisciplinary Studies was convened by the Chairperson, Prof. Pradeep Shridhar on June 15, 2020 from 11:30 am on Zoom Meeting App.

The agenda of the meeting was discussion on and approval of the "Proposal, course structure and draft ordinances for Masters in Computational Linguistics, to be started from Session 2020 - 21 under the Centre for Transdisciplinary Studies".

The following suggestions were proposed and subsequently approved and passed by the committee -

- Prof. Imtiaz Hasnain proposed that the program may be converted into a 5-year Integrated M.Sc.

  Prof. Pradeep Shridhar acknowledged his suggestion but presented the infrastructural and technical issues in the implementation of this proposal. The committee agreed with this and it was resolved that it may be taken up at a later stage, after the M.Sc. program has started.

- Prof. Manu Pratap Singh suggested that courses on Artificial Neural Networks and Artificial Intelligence may also be included in the program

  Dr. Ritesh Kumar informed that the courses related to these are now already added to the list of courses.

- Prof. Vineeta Singh suggested that course on Stylometry may also be included in the program as an elective course.

  The committee agreed to this and the course related to this is added to the list of courses.

- Prof. Sanjay Chaudhary suggested that we need to figure out the modalities of implementation of this program at some stage so that it could run smoothly

  The committee agreed to this and it was resolved that it could be further discussed once the full syllabus of the program is ready.

- Dr. Monojit Chaudhary proposed that soft core courses need to decided based on the students' background and all should not be compulsory for all students

  Dr. Ritesh Kumar informed that it is indeed the case and is now explicitly mentioned in the new version of the ordinances.

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- Dr. Monojit Chaudhary proposed that the course on "Web and Mobile Applications and Application Programming Interfaces for NLP" may not be tenable as a theory course and needs to be more hands-on, lab kind of course.

  Dr. Kalika Bali agreed to this.

  The committee also agreed to this and subsequently the course has been renamed as "User Applications for NLP" and explicitly converted into a practical / lab course.

- Dr. Kalika Bali raised the issue of 'lateral entry' in the 3rd semester and if 2 semesters will be sufficient for people to learn everything.

  Dr. Ritesh Kumar said that it is meant for those students who dont want to do a full masters again.

  Prof. Imtiaz Hasnain suggested a 6-month / 1 semester Foundation Course for those who are coming in via lateral entry.

  Prof. Sanjay Chaudhary said that lateral entry may be possible if a prior test is conducted and it is restricted.

  Prof. Manu Pratap raised the issue of elementary knowledge of mathematics and computer of humanities students, even for the regular students and suggested an additional 6-month mandatory foundation course for all the students.

  Prof. Pradeep Shridhar raised the issue of the legality of a two-and-a-half year program.

  Dr. Ritesh Kumar proposed that instead of extending it by 6 months, we may include remedial / elementary courses for students who need those courses and these will be non-credit pass/fail courses.

  Prof. Vineeta Singh suggested that the students with lateral entry may be asked to do extra courses from the first 2 semesters, if needed.

  Dr. Kalika Bali suggested that we could go ahead with lateral entry with foundation course of 6 months / 1 semester.

  Prof. Sanjay Chaudhary suggested that there is no need for additional courses for the students of lateral entry – only if the students already have requisite knowledge will they be taken in.

  Dr. Atul Kr. Ojha concurred on this.

  Dr. Monojit Chaudhary suggested to get away with the lateral entry altogether.

  Prof. Vineeta Singh reiterated that students may need to do extra courses and if they could agree to do extra courses, they may be given lateral entry.
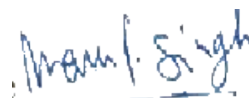
  Dr. Kalika Bali concurred that no one can do a computational linguistics program in one year. She also proposed that too much of course work may lead to less learning and more race to complete the courses somehow. As such she proposed to make the entrance really stringent for the lateral entry, if it has to be done.

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Prof. Sanjay Chaudhary proposed that we could temporarily halt the lateral entry for now and depending on the kind of students we are getting and other factors, it may be started at a later period.

The committee agreed to this and it was resolved that the provision for lateral entry will remain but it will be started 2 or 3 years later, depending on the feedback and demand from the student community. The ordinances have been accordingly modified and updated.

The meeting was attended and the minutes approved by the undersigned.

2020   Jun 17 2020

Prof. Imtiaz Hasnain, External Expert Member
Department of Linguistics
Aligarh Muslim University, Aligarh

Jun 17

Dr. Kalika Bali, Member
Microsoft Research Labs
Bangalore

2020   Jun 17 2020

Dr. Monojit Chaudhary, Member
Microsoft Research Labs
Bangalore

Jun 17

Dr. Atul Kr. Ojha, Member
Panlingua Language Processing LLP
New Delhi

Jun 16 2020

Dr. Ritesh Kumar, Member
Department of Linguistics
K.M. Institute of Hindi and Linguistics

Jun 17 2020

Prof. Sanjay Chaudhary, Member
Department of Mathematics
Institute of Basic Sciences

Jun 17 2020

Prof. Vineeta Singh, Member
Department of Statistics
Institute of Social Sciences

Jun 17 2020

Prof. Manu Pratap Singh, Member
Department of Computer Science
Institute of Engineering and Technology

Jun 18 2020

Prof. Harivansh Singh, Member
HoD, Department of Linguistics

Jun 18 2020

Prof. Pradeep Shridhar, Chairperson
Director, K.M. Institute of Hindi and Linguistics

PROPOSAL

Master of Science in Computational Linguistics
&
Centre for Transdisciplinary Studies

CENTRE FOR TRANSDISCIPLINARY STUDIES

Dr. Bhimrao Ambedkar University, Agra

Monojit Choudhury   Atulojha

Prof. Imtiaz Hasnain

Section 1
Proposal Summary

1.1 **Proposal Objectives**

This proposal contains two sub-proposals -

a) Establishment of the '**Centre for Transdisciplinary Studies**' in the University that will allow for running inter and transdisciplinary, industry-oriented programs of study shared jointly by multiple departments within the University as well as other academic and industry partners and collaborators. A basic proposed structure and function of the centre is given in the next section of the proposal. **[Details in Section 2]**

b) Starting **M.Sc. in Computational Linguistics** (referred to as the Master in Computational Linguistics in this proposal) as the founding program of the centre, to be offered jointly by the Department of Linguistics, Department of Statistics, Department of Mathematics and Department of Computer Science and coordinated by the Department of Linguistics. The industry partners may tentatively include Microsoft Research India, Bangalore, Panlingua Language Processing LLP, New Delhi and others (talks and negotiations are underway with more partners and hopefully some will come on-board with us). **[Details in Section 3 - 5]**

1.2 **Summary**

A brief overview of the Master program is given here. The details are give in the subsequent sections -

1. **Name of the Program of Study**

   M.Sc. in Computational Linguistics

2. **Duration of the program**:

   4 Semesters / 2 Years

3. **Detailed List of Courses**:

   See **Section 4** of the proposal

4. **Number of students [Details in Section 5]**

   10+

   We will start with 10 students and the number of students will be increased depending on the demand
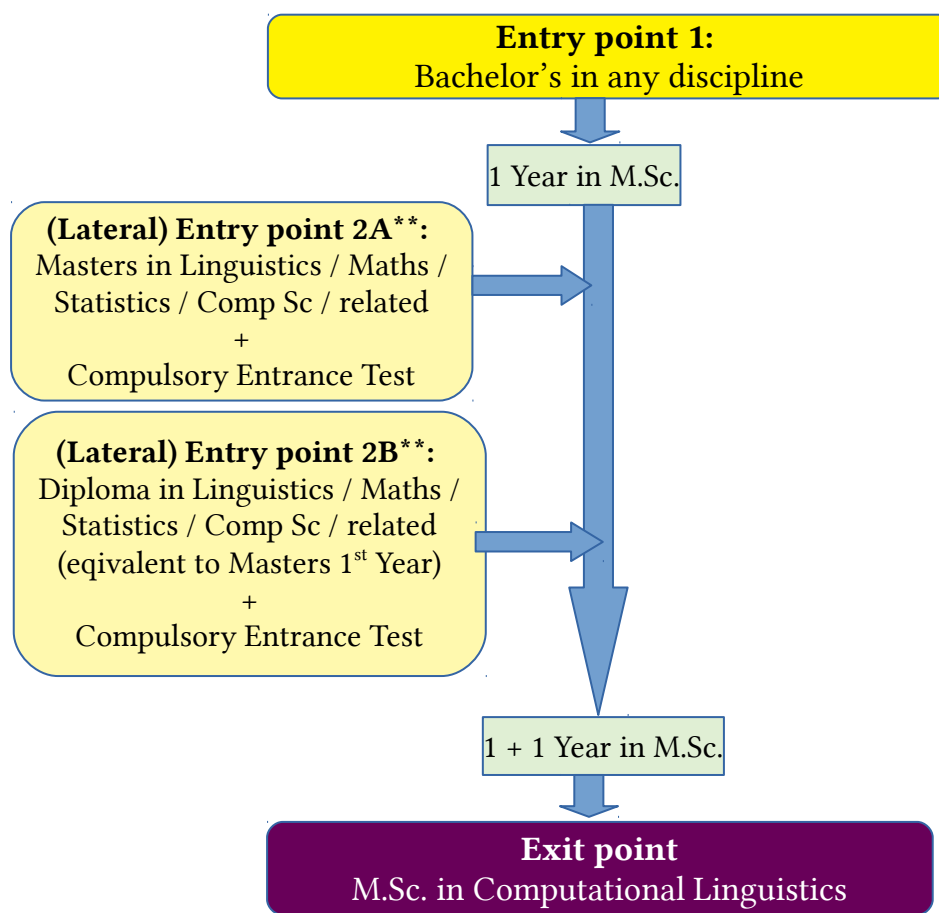
for the program – the formula for increment is included in the draft ordinance.

5. **Minimum Qualification for admission [Details in Section 5]**

<u>For Direct Admission:</u> Graduate in any discipline with 45% marks

<u>For Lateral Entry (in 3rd Sem)</u>**: Post-graduate in Linguistics/Statistics/Maths/Computer Science/related/equivalent subject (as decided by the program co-ordinators in case of a conflict)/Diploma in Linguistics (or any one of the disciplines of the participating departments, equivalent to First Year of Postgrad in the concerned subject) + Minimum Qualifying Marks Compulsory Eligibility Test for Lateral Entry

The overall flow of incoming / outgoing students is given below

Entry point 1:
Bachelor's in any discipline

1 Year in M.Sc.

(Lateral) Entry point 2A:**
Masters in Linguistics / Maths / Statistics / Comp Sc / related
+
Compulsory Entrance Test

(Lateral) Entry point 2B:**
Diploma in Linguistics / Maths / Statistics / Comp Sc / related
(eqivalent to Masters 1st Year)
+
Compulsory Entrance Test

1 + 1 Year in M.Sc.

Exit point
M.Sc. in Computational Linguistics

Note: Lateral entry to the program will <u>not</u> start <u>before</u> Session 2022 – 23 or at least 2 years after the start of the program, whichever is later. It may be started only after a thorough analysis of feasibility, need and demand among the prospective students. Furthermore, if started, it will be available as an exception rather than a rule, will be subject to the availability of vacant seats in the current session and the students will need to compulsorily go through a stringent, comprehensive entrance examination / interview to ensure that they possess minimum prior competence for successfully completing the program in 2 semesters.

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6. **Details of Fees**:

    <u>Tuition Fees</u>##   :   Rs. 8,000 per semester

    <u>Examination Fees</u>   :   Rs. 2,070 per semester

    <u>Dissertation Fees</u>   :   Rs. 2,000 (one-time in the final semester)

##**Note:** Since it is a self-financed program of study, the tuition fees of the program will be revised every 3 years with an increment of 10% - 20% per semester as a function of the proportion of seats filled up. If all the seats are filled up, the increment will be of 20%. If it is 50% or less then increment is of 10%. There will be a 2% additional fee increase for every 10% increase in the number of filled seats for the program. (details included in the ordinances).

7. **Details of income / expense**:

At this point, the program does not entail any additional recurring expense for the University

The direct income will be from the different kinds of fees (which could be in the range of Rs 1.6 Lakhs – 3 Lakhs per annum, subject to the number of students enrolled)

8. **Are these programs approved by the departmental academic committee / University academic committee / Academic Council?**:

The program was approved by the departmental committee of the Department of Linguistics. An in principle, provisional approval in advance has also been obtained from all the 4 participating departments – Linguistics, Mathematics, Statistics and Computer Science – as well as the 2 industry partners mentioned in the proposal. Approval from other industry partners and academic institutions will be formalised after the approval of the proposal. It will also need to be subsequently approved by the newly proposed centre's academic bodies and also the University bodies.

9. **Can these programs be funded by any body?**

It could be possibly funded by the industry partners. Otherwise, an agreement of mutual collaboration with different partners will largely rule out the need for external funding. Also the program may become sustainable through its own resources.

10. **Any other details, if applicable**:

a) The program proposes collaboration with 'Research' wings of Industry as well as, possibly, other academic organisations and involve them in the decision-making bodies as well as teaching-learning process (may be implemented via honorary / visiting teaching positions and providing

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some space to them for establishing labs, offices, etc). Honorarium may be paid to them as per the University norms, subject to the availability of sufficient funds.

b) The program will include online / on-campus lectures / courses by experts / researchers from the industry (incl those who do not enter into a formal collaboration with us) as well as academia specialising in this field of research. Honorarium may be paid to them as per the University norms, subject to the availability of sufficient funds.

c) Additional teaching as well as non-teaching staff may be hired on part-time / full-time / guest / contractual basis, subject to the availability of sufficient funds from the centre or the University, as the case may be.

d) The current vacant position(s) / any future vacant position(s) of the Department of Linguistics (as well as the other collaborating departments) at any level (Assistant Professor, Associate Professor or Professor) may be filled with the faculty specialising in any area of Computational Linguistics or a related sub-discipline so as to lend support to the program and establish the centre as a super-speciality centre for excellence in this field, subject to the approval of the relevant departments.

e) Joint supervision for M.Sc.. / MPhil / PhD dissertations where the students may take up the problems suggested by the industry partners and work on those with them.

f) Internships at the industry partners, with an aim to contribute to their research and development efforts.

g) Resource and IPR sharing with industry and other partnering institutions.

h) The program proposes a mutual 'collaboration / understanding' with the Industry partners such that they share their knowledge and expertise with us and in turn the University students and faculties work with them and help in solving some of their problems – this will entail no financial commitments from either side.

i) **The Master program is not dependent on the formation of the 'Centre for Transdisciplinary Studies'. The program may be offered and run by the Department of Linguistics, if the centre does not come into being; but the centre will give the program required independence, freedom and, hopefully, visibility to the program. At the same time, we hope that it will make it easier to manage the program.**

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Table 1.1: Summary of Fees, Seats and Qualifications

S. No.	Name of Programme	Semester Fees (per semester)	Exam Fees (per semester)	Number of Seats	Minimum Qualification
1.	M.Sc. in Computational Linguistics	Rs. 8,000	Rs. 2,070 + Rs. 2,000 (one-time dissertation fees)	10+	**a. For regular entry**: Graduation in any discipline with 45% or equivalent (for admission in 1st year) **b. For lateral entry in second year / 3rd Sem** Post-graduation in Linguistics / Maths / Statistics / Computer Science / Equivalent + Entrance **OR** Diploma (equivalent to first year of Masters) in Linguistics / Maths / Statistics / Computer Science / Equivalent + Entrance

Section 2

Centre for Transdisciplinary Studies (CTRANS)

2.1 Motivations and Objectives

The major objective of floating a new Centre for Transdisciplinary Studies is to promote the idea and culture of inter and transdisciplinary studies in the University. Traditionally, the academic structure of the University is divided into rather tightly demarcated departments, which hardly talk to each other, let alone collaborate academically with each other. However, the latest research in various fields have shown that transcending disciplinary boundaries is no longer an option – in order to carry out meaningful and impactful research with an aim to solve a real-world problem, interdisciplinarity and transdisciplinarity has become an absolute necessity.

The idea of this centre is to develop a platform where multiple disciplines could come together seamlessly and work together as one unit towards solving a common problem. The centre will allow different departments to come together and propose programs of study that require expertise from different disciplines without the need of interfering with the traditional roles that individual departments play and the way they function.

2.2 Scope of the Centre

The centre will allow for any program of study and research that would require 2 or more departments from the University to collaborate, ideally, in equal proportion (in terms of distribution of workload, courses and learning objectives of the students). The centre will start with the following program -

- Master of Science in Computational Linguistics

This program will be jointly offered by the following departments of the University

- Department of Linguistics [K.M. Institute of Hindi and Linguistics] – Coordinating Department

- Department of Mathematics [Institute of Basic Sciences] – Co-coordinating Department

- Department of Statistics [Institute of Social Sciences] – Co-coordinating Department

- Department of Computer Science [Institute of Engineering and Technology] – Co-coordinating Department

A tentative list of the industry partners for the program include the following (this is subject to approval and more partners may be included at a later stage)

- Microsoft Research India – Bangalore – Industry Partner

- Panlingua Language Processing LLP– Industry Partner

However, the scope of the centre extends beyond this one program and in future more innovative, industry-oriented and multi-departmental programs may be introduced. Some such programs may include programs on

- Data Sciences

- Digital Humanities

- Artificial Intelligence

- Any other program of interest

2.3 **Structure of the Centre**

The centre will have a completely decentralised structure with most of the administrative and financial powers with respect to a specific program with the Program Director of individual programs. If a centre-level decision has to be taken then that will be jointly taken by all the program directors and coordinators of all the programs running in the centre (by majority voting, in case of disagreement). However, the decision related to programs of study to be started at the centre will be taken by the individual participating departments and may be approved by the competent bodies of the University.

The Academic Committee of each program will consist of the following, with the chair of the academic committee of the coordinating department as the ex-officio chair of the programme's committee -

- All members of academic committee of the coordinating department / institute

- Program Director and Coordinators from all the collaborating departments

- At least one or maximum two members from each of the collaborating industry and academic partners.

2.4 **Requirements of the Centre**

There is no immediate requirement of the centre except the space for classrooms / lab and office space of the visiting industry partners of the specific programs. The other resources at different participating departments may be initially shared for the program. The centre may build its own resources over a certain period of time via research projects (of different program directors and coordinators), external funding, etc.

Section 3

Master of Science (M.Sc.) in Computational Linguistics

[henceforth referred to as Masters in Computational Linguistics]

3.1. <u>Overall Composition</u>

Masters in Computational Linguistics will be jointly offered by the 4 departments of the University and 2 tentative Industry Partners (industry partners subject to approval and to be updated) –

- Department of Linguistics (K.M. Institute of Hindi and Linguistics)

- Department of Statistics (Institute of Social Sciences)

- Department of Computer Science (Institute of Engineering and Technology)

- Department of Mathematics (Institute of Basic Sciences)

- Microsoft Research India, Bangalore

- Panlingua Language Processing LLP, New Delhi

The programme will be coordinated by the Department of Linguistics under the aegis of the proposed Centre for Transdisciplinary Studies.

3.2 <u>Program Motivation</u>

Processing natural languages is one of the most difficult but at the same time most essential requirements of modern times. As computers have made inroads in every sphere of our life, it is realised that the full potential of automation or artificial intelligence cannot be realised without developing machine that could understand, process and generate human languages. As such Natural Language Processing and Computational Linguistics have found its application in areas ranging from healthcare and defense to legal domain and digital assistants. If we list out some of the most common applications of the NLP in our world, they would include chatbots / personal assistants / any kind of voice-enabled application in any machine (also called Conversational AI), machine translation, text summarization, OCR technologies, search engines / information retrieval systems, automatic speech recognition and numerous others.

Having said this, it also remains a fact that such technologies are not really available for our very own major as well as regional and local languages. The chatbots dont work in Braj Bhasha (or even official languages like Bodo or Manipuri), there are no machine translation systems for Awadhi or Santhali, there are hardly any resources to build those. To make things worse, there are very few trained computational linguists in South Asia / India, working on South Asian / Indian languages – they could be counted on our fingers. One of the main reasons for this is the lack of dedicated, state-of-the-art training centres and departments in the region /

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country. Barring a couple of departments and degrees, which still are bound by the parochial disciplinary boundaries, unfortunately India (and South Asia, in general) doesnt have a truly multi-disciplinary centre for teaching and research in the field. This program aims to fill that gap and create first truly multi-departmental program in computational linguistics in South Asia / India where students will be trained by experts from 4 different departments of the University – Linguistics, Mathematics, Statistics and Computer Science – and mentored by the professional and experts of the field in Industry. We hope that this experimental program will be able to train truly outstanding talents in India who will work and contribute towards the development of language technologies for South Asian / Indian languages (especially low-resourced, minority and endangered languages) in multiple domains (especially with respect to socially-aware systems).

3.2 **Program Objectives**

The purpose of this programme is to acquaint the students with the aspects of the extremely fascinating area of Natural Language Processing and Computational Linguistics and train them for research in this field, especially with respect to working with low-resource, minority and endangered languages and developed of socially-aware NLP systems. This course outline is prepared keeping in view that the students should have a sound background in different theoretical and methodological orientations of Linguistics, Computer Science as well as Computational Linguistics. At the same time, NLP being an applied field, they should be well-equipped to develop real-life applications which are both innovative and useful for different linguistic and cultural communities of the country. Thus every course include both theoretical as well as application-oriented approach.

3.3 **Program Overview [Broad Structure and Evaluation]**

The program broadly is divided into 4 groups

- Language Sciences

- Computer Science

- Mathematics/Statistics

- Natural Language Processing.

The core courses in each of the group is designed in such a way that they introduce the students to different areas and methodologies needed by a computational linguist and the elective courses provide either a more in-depth study of these areas or introduce a new, emerging area of interest. Thus, while being aware of different orientations in the field, the student could select areas of their interest for a more in-depth knowledge in that area through the elective courses.

The detailed course outline for each course may be decided by the course instructor in consultation with the

program academic committee / board of studies at the beginning of the semester. The normal evaluation pattern of the courses will largely follow the CBCS guidelines of the University and will be as follows -

Continuous Assessment: 40%

Lab / Project: 30%

End-Sem Exam: 30% (written / practical exam of minimum 3 hours)

In Group A and C, the end-sem exam will be a written exam of minimum 3 hours.

In Group B and D, the end-sem may consist of a mix of practical and written exam such that written exam is not of more than 50% weightage. In these courses, the written exam may also be completely done away with.

It is to be noted that the question paper setting and assessment for the end-sem exam will be carried out by the concerned course instructor, as per the CBCS norms.

For the course ALI107, Field Methods and Language Documentation, the evaluation pattern will be as follows

Field Work Report: 60% (evaluated by BOTH external examiner and course instructor(s))

Presentation (based on the report): 40%

The courses ALI172 Fundamental of Programming for NLP with Python and ALI175, User Applications for NLP are lab courses and there will not be any written examination for these courses.

The Non-credit courses will be graded as only pass/fail and the assessment pattern may be decided by the course instructor.

3.3 **Program Credit Requirements and Duration – for regular students**

Masters in Computational Linguistics is a 2-year programme spread over 4 semesters. In any semester, 20 credits is the normal workload. A student may register for extra credits upto a maximum of 30 credits per semester and a minimum of 10 credits per semester. A total of 90 credits is to be earned across 4 semesters, including 70 credits from the core courses and the project/internship + dissertation.

Depending on the background of the students, an evaluation of their needs and their own interest / preferences, each student may be put into one or more of Group A, B and C by the course adviser, in consultation with the program director and coordinators such that the students will need to complete all the core courses from the assigned group(s). Group D will remain compulsory for all the students. In general, students with a background in Linguistics may not need to complete courses from Group A; similarly, depending on their prior experience, students with background in computer science and maths / statistics may be exempt from completing courses in Group B or C or both. In such situations, the students may still choose to complete the core courses from these groups; alternatively they may opt for elective courses from any of the groups or departments to complete the credit requirements for the program.

In the first semester, there will be 1 core course from each of Group B and D and 2 core courses from each of

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Group A and C. In the rest of the three semesters, there will be 1 core course from each of the four Groups. The rest of the elective courses may be completed from any of the 4 groups or anywhere other than the participating departments, subject to the minimum credit requirement as mentioned above.

There will also be a Capstone Project (leading to the development of a real-life application) or an Internship of at least 1 month in industry or academia, to be completed in the 3rd or the 4th semester. The students will also need to complete a dissertation spanning across the last 2 semesters of the program (but submitted in the last semester of the program). The report of the project or the work done during the internship may be integrated in the dissertation to be submitted at the end of the program. The electives throughout the 4 semesters can be opted from the ones offered by the department as well as from any other department subject to the condition that a minimum of 70 credits is earned from the departmental core / elective courses and the project / internship in the 3rd or the 4th semester and dissertation across the last two semesters. Rest of the 20 credits may be earned from the departmental electives or open electives (from any department in the University other than those jointly offering the programme) or a combination of these.

3.4 **Program Credit Requirements and Duration – for Lateral Students**

Masters in Computational Linguistics allows for the lateral entry of students in the 3rd semester of the program. The lateral students will be offered the same courses in their 2 semesters as will be offered to the Masters in Computational Linguistics students in their last 2 semesters. In order to earn Masters in Computational Linguistics, the students will be required to complete a minimum of 50 credits over the period of 2 semesters including 38 credits from the core courses and the project/internship + dissertation. The electives can be opted from the ones offered by the participating departments as well as from any other department subject to the condition that a minimum of 38 credits is earned from the program's core / elective courses during the period of 2 semesters. Rest of the 12 credits may be earned from the program electives, open electives or a combination of these.

Besides these, lateral students will also be required to complete the two non-credit courses and introductory courses (offered in the first 2 semesters) from the fields other than those of their previous studies (as recommended by the Program Director and coordinators, based on the entrance test result and other appropriate evaluation). The students will earn additional credits for these introductory courses and will not count into the minimum credit requirement mentioned above.

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Section 4

Tentative List of Courses [for Masters in Computational Linguistics]

Course Code	Course Title	Credits
Non-credit Compulsory Courses		
ALI211NC	Communication and Academic Writing Skills	--
ALI212NC	Research Ethics in Natural Language Processing	--
Soft Core Courses [Group – A: Language Sciences]		
ALI102	Introducing Phonetics and Phonology	4
ALI103	Introducing Morphological and Syntactic Analysis	4
ALI104	Introducing Sociolinguistics	4
ALI106	Introducing Semantics and Pragmatics	4
ALI145	South Asian Linguistic Diversity and Typology	4
Soft Core Courses [Group – B: Computer Science]		
ALI172	Fundamental of Programming for NLP with Python	4
ALI173	Machine and Deep Learning for Natural Language Processing - I	4
ALI174	Machine and Deep Learning for Natural Language Processing - II	4
ALI175	User Applications for NLP	4
Soft Core Courses [Group – C: Mathematics / Statistics]		
ALI201	Univariate Statistics using Python	4
ALI202	Probability Theory and Probabilistic Models	4
ALI203	Linear Algebra and Linear Programming	4

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ALI204	Multivariate Calculus	4
Core Courses [Group – D: Natural Language Processing]		
ALI176	Language Resources and Technologies: Fundamentals	4
ALI177	Language Resources and Technologies: Low-resource, Minority and Endangered Languages	4
ALI178	Language Resources and Technologies: Advanced	4
ALI179	Computational Sociolinguistics and Pragmatics	4
Capstone Project / Industrial / Academic Internship [either in the 3rd or the 4th sem]		4
Dissertation [spanning across the 3rd and the 4th Sem]		6

Elective Courses [Group – A: Language Sciences]

ALI105	Introducing Generative Syntax	4
ALI107	Field Methods and Language Documentation	4
ALI108	Phonological analysis	4
ALI109	Acoustics and Experimental Phonetics	4
ALI110	Instrumental Phonetics	4
ALI111	Optimality Theory	4
ALI112	Generative Morphology	4
ALI113	Word-based Morphology	4
ALI114	Generative Syntax – II	4
ALI115	Linguistic Minimalism	4
ALI116	Logic and Natural Language Semantics	4
ALI117	Pragmatics	4

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ALI118	Theories in Linguistics	4
ALI119	Grammatical Categories \ Basic Linguistic Theory	4
ALI120	Semiotics and philosophy of structures	4
ALI121	Historical and comparative Linguistics	4
ALI122	Language Learning and Language Pedagogy	4
ALI123	Second Language Acquisition and Teaching	4
ALI124	Neurolinguistics and Language Disorders	4
ALI125	Structures of Languages	4
ALI126	Endangered languages. Issues and Perspectives	4
ALI127	Areal Linguistics \ South Asia as a Linguistic Area	4
ALI128	Developmental Psycholinguistics	4
ALI129	Experimental Psycholinguistics	4
ALI130	Cognitive Linguistics	4
ALI131	Language Politics and Planning in India	4
ALI132	Conversation Analysis and Discourse Analysis	4
ALI133A	Seminar - I	4
ALI133B	Seminar - II	4
ALI144	Exploring Language, Mind and Brain	4
ALI146	Indian Linguistic Tradition	4
ALI147	Writing Grammars	4
ALI165	Biolinguistics	4
ALI166	Sociology of Language	4

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ALI167	Forensic Linguistics	4
ALI168	Perceptual Dialectology	4
ALI169	Language and Education	4
ALI170	Sign Language Linguistics	4
ALI171	Language and Gender	4
Elective Courses [Group – D: Natural Language Processing]		
ALI134	Grammatical Frameworks in Computational Linguistics - I	4
ALI135	Grammatical Frameworks in Computational Linguistics - II	4
ALI136	Hybrid Systems for Natural Language Processing	4
ALI137	Computational Lexicography	4
ALI138	Machine Translation	4
ALI139	Language Technologies for Artificial Intelligence	4
ALI142	Corpus Linguistics and Quantitative Methods	4
ALI148	Computational Semantics and Pragmatics	4
ALI180	Crowdsourcing for Speech Technology & Natural Language Processing	4
ALI181	Introduction to Speech Technology	4
ALI182	Spoken Dialogue Systems	4
ALI183	Language Documentation and Computation	4
ALI184	Creating Natural Language Processing Resources for Resource-Poor Languages	4
ALI185	Linguistic Expressions and Processing of Sentiment, Subjectivity & Stance	4
ALI186	Automatic Processing of Social Media Data	4
ALI187	Understanding and identifying Politeness, Impoliteness and Aggression in Human	4

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	Language	
ALI188	Deep Processing Techniques for Natural Language Processing	4
ALI189	Computational Discourse Modelling	4
ALI190	Processing Multilingual and Code-mixed Data	4
ALI191	Social Implications of Natural Language Processing	4
ALI192	Natural Language Processing for Artificial Intelligence	4
ALI193	Automated Speech Recognition and Synthesis	4
ALI194	Computational Natural Language Learning	4
ALI211	User Interfaces and User Experience in Natural Language Processing Applications	4
ALI212	Linked Open Data in Linguistics	4
ALI217	NLP and Stylometry	4
Elective Courses [Group – B: Computer Science]		
ALI195	Big Data	4
ALI196	Social Network Analysis	4
ALI197	Database Management Systems	4
ALI198	Data Mining	4
ALI199	Pattern Recognition	4
ALI200	Artificial Intelligence	4
ALI205	XML and Semantic Web Technologies	4
ALI206	Signal Processing	4
ALI213	Web Programming	4
ALI214	Information Storage and Retrieval Techniques	4

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ALI215	Programming with C	4
ALI216	Object-oriented Programming in Java	4
Elective Courses [Group – C: Mathematics / Statistics]		
ALI207	Advance Probability Theory and Probabilistic Models	4
ALI208	Advance Linear Algebra and Linear Programming	4
ALI209	Advance Multivariate Calculus	4
ALI210	Convex Optimization	4
Non-credit Elective Courses		
ALI213NC	Fundamentals of Mathematics and Statistics	--
ALI214NC	Basic Computer Awareness	--
ALI215NC	Introduction to Language and Linguistics	--

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Brief Outlines / Description of Core Courses

Group A

Note: All the courses in this group is expected to cover the fundamentals of what is known as 'core' Linguistics and are largely theoretical / empirical in nature with minor components of how these could possibly prove to be useful in NLP

ALI102 Introducing Phonetics and Phonology

The course aims at introducing the basic principles and tenets of General Phonetics and Phonology. The later half of the course will be concerned with the function, behaviour and organization of sounds of linguistics units. It will introduce students to the basic ideas such as IPA, acoustic and articulatory phonetics, distinctive features, phonemic and phonological processes and analysis. It will also introduce different theories and methodologies of phonological analysis such as standard generative phonology, autosegmental phonology, optimality theory and others.

ALI103 Introducing Morphological and Syntactic Analysis

This course will introduce students to the fundamentals of morphological and syntactic analysis including basic word formation processes, structure of words, different grammatical categories and methods of morpho-syntactic analysis. It will also introduce different syntactic theories such as phrase structure and minimalism, dependency grammar, tree-adjoining grammar, constraint grammar, HPSG, etc.

ALI104 Introducing Sociolinguistics

The course introduces the students to the fundamentals of the interaction of language and society. It gives an overview of both the effects of sociological factors on human language and different aspects related to language in the society and covers key ideas such as multilingualism, variation, social networks, language standardization, politics and attitude, language endangerment and interactional sociolinguistics.

ALI106 Introducing Semantics and Pragmatics

This course introduces lexical semantics and lexical relationship among words such as synonyms, antonyms, meronyms, etc; compositional semantics and pragmatics. It will include discussion on entailment, presupposition, implicatures, speech act theory and more recent discursive and post-modernist advances in pragmatics.

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ALI145 South Asian Linguistic Diversity and Typology

This course will be a combination of typical historical linguistics, linguistic typology and areal linguistics courses in postgraduate linguistics programs. It will introduce students to different language families of South Asia / India, how language families are constructed, their typological and areal features and, in general, why it makes sense to talk about 'South Asian / Indian' Languages.

Group B

Note: All the courses in this group is expected to cover the fundamentals of programming and computer science ideas, specially related to machine learning (and deep learning) and software / application development within NLP.

ALI172 Fundamental of Programming for NLP with Python

This course will give an introduction to programming in Python with a special focus on processing natural languages.

ALI173 Machine and Deep Learning for Natural Language Processing – I

It will cover the fundamental of machine learning models such as linear and logistic regression, MP Neuron, Artificial Neural Networks, Naive Bayes, SVM, Random Forest, Hidden Markov Models, Word Embeddings and how they are used in NLP.

ALI174 Machine and Deep Learning for Natural Language Processing – II

It is an advanced course in machine learning with discussions focussing on different architectures and models of more recent Deep Neural Networks, especially those proposed for NLP as well as image processing and vision (required for multimodal language processing).

ALI175 User Applications for NLP

This is a lab course that will focus on the development of web, mobile and application programming interfaces with specific emphasis on including NLP models at the backend. Since NLP models are generally complex and requires significant processing, the focus will also be on developing efficient and fast user interfaces.

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Group C

Note: All the courses in this group is expected to cover the fundamentals of mathematics and statistics with a focus on those aspects which are vastly used in computer science and NLP. These are expected to be covered within the context of machine learning and NLP

ALI201 Univariate Statistics using Python

This course will discuss the basic descriptive statistics, inferential statistics including Hypothesis testing, error analysis; linear and multiple regression including transformation, different families of models and the generalized linear model (GLM).

ALI202 Probability Theory and Probabilistic Models

This course will introduce the fundamentals of probability theory including random variables, bayes theorem, expectation, conditional and joint distributions, moments; different kinds of sampling methods; and different discrete and continuous probability distributions including Bernoulli, Binomial, Multinoulli, Multinomial, Normal, Exponential, Pareto, etc.

ALI203 Linear Algebra

This course will cover the basics of linear algebra including vectors and matrices, eigenvalues and eigenvectors, linear transformations, SVD.

ALI204 Multivariate Calculus

This course will include different aspects of multivariate calculus such as vector-valued functions, partial-derivatives, gradient, hessian, Jacobian, Laplacian and others.

Group D

Note: All the courses in this group is expected to cover various aspects, methodologies, algorithms, approaches and facets of developing language resources and technologies. A huge focus of these courses will be on Indian languages but that does not entail exclusion of languages from across the globe.

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ALI176 Language Resources and Technologies: Fundamentals

This will be an introductory course in different methods and approaches to development of language resources and technologies, with a focus on South Asian / Indian languages. It will cover the fundamental of corpus creation (especially focussed on social media but also other sources) and storage (XML and related technologies), annotation (semi-automatic, manual and crowdsourcing) and development of basic tools and technologies such as Spell and Grammar Checkers, POS taggers, lemmatisers, morphological analysers, language identifiers and basic text classification systems. The course will focus on probabilistic and statistical methods.

ALI177 Language Resources and Technologies: Low-resource, Minority and Endangered Languages

This course will be focussed entirely on the development of resources and technologies for minority and endangered languages, especially those which have scarce social media presence. It will discuss and give experience of the field methods of linguistic data collection and annotation of unknown languages. This course will include first-hand experience of data collection from the field, its 'annotation' and representation (Linked Open Data). It will also discuss the methods of developing language technologies with low / scarce data, especially with the help of a combination of dictionary / rule-based methods (eg automated development of WordNet using the field data and its use in technology development) and statistical methods.

ALI178 Language Resources and Technologies: Advanced

This course will be an advanced introduction to the development of NLP applications such as parsers, machine translation systems, information retrieval systems, text summarisation, question answering, etc.

ALI179 Computational Sociolinguistics and Pragmatics

This course will focus on the development of systems that could work process different kinds of sociolinguistic phenomena and information and infer pragmatic information from given texts / speech. This lies at the cutting-edge of the modern NLP applications and an area of active research.

Section 5

Draft Ordinances [for Masters in Computational Linguistics]

ORDINANCES RELATING TO THE AWARD OF MASTER OF SCIENCE IN COMPUTATIONAL LINGUISTICS DEGREE IN CENTRE FOR TRANSDISCIPLINARY STUDIES

In exercise of the powers conferred by sub-section (3) of Section 52 of the Uttar Pradesh State University Act, 1973 (President's Act No. 10 of 1973), as reenacted and amended by the Uttar Pradesh Universities (Re-enactment and Amendment) Act, 1974 (U.P. Act No. 29 of 1974) and in supercession of all the previous ordinances on the subject, the Executive Council, hereby makes the following ordinances in order to regulate the award of Masters of Science in Computational Linguistics degree through the Choice-based Credit System (CBCS).

1.01 – These Ordinances may be called "**Masters in Computational Linguistics Degree Ordinances 2020**"

1.02 – They shall come into force from the **session 2020 - 21**

2. **Minimum Eligibility for Admission to M.Sc. in Computational Linguistics (henceforth, Masters in Computational Linguistics) Programme**

2.1 A candidate shall be eligible for admission to the programme leading to the award of Master's degree if she/he has obtained a Bachelor's degree under 10+2+3 pattern recognized by the University or a degree recognized as its equivalent with minimum 50% (or its equivalent CGPA) for candidates belonging to General and OBC category and 45% (or its equivalent CGPA) for SC/ST/PH/Women candidates.

2.2 A candidate may also be be eligible for admission to the 3rd semester of 4 semester course leading to Masters in Computational Linguistics provided that she/he has completed a postgraduate degree in Linguistics or Computer Science or Mathematics or a related and its equivalent field with minimum 50% (or its equivalent CGPA) for candidates belonging to General and OBC category and 45% (or its equivalent CGPA) for SC/ST/PH/Women candidates in both the Bachelor's degree under 10+2+3 pattern as well as the postgraduate degree

> *Provided* that the candidate passes the compulsory 'Entrance Test for admission to the 3rd Semester of Masters in Computational Linguistics' to be conducted by the centre for such applicants.

2.3 A candidate may also be be eligible for admission to the 3rd semester of 4 semester course leading to Masters in Computational Linguistics provided that she/he has completed a Diploma in Linguistics or Computer Science or Mathematics or a related and its equivalent field (equivalent to the first 2 semesters of the Masters degree in the concerned discipline) with minimum 50% (or its equivalent CGPA) for candidates belonging to General and OBC category and 45% (or its equivalent CGPA) for SC/ST/PH/Women candidates in both the Bachelor's degree under 10+2+3 pattern as well as the postgraduate degree

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Provided that the candidate passes the compulsory 'Entrance Test for admission to the 3rd Semester of Masters in Computational Linguistics' to be conducted by the centre for such applicants.

2.4 It is to be noted that admission to the 3rd semester of 4 semester course leading to the Masters in Computational Linguistics will not start before Session 2022 – 23 or at least 2 years after the start of the program, whichever is later.

Provided that it may be started in any session after the above-mentioned period.

Provided further that it may be started only after a thorough analysis of feasibility, need and demand among the prospective students.

Provided further that, if started, it will be available as an exception rather than a rule and in each session admission in the 3rd semester of the program will be subject to the availability of vacant seats vis-a-vis total seats available in the program in the current session

Provided further also that the students will need to compulsorily go through a stringent, comprehensive entrance examination / interview to ensure that they possess minimum prior competence for successfully completing the program in 2 semesters.

3. **Duration of the programme**

3.2. The curricular work leading to the award of Master's Degree shall be spread over a minimum of four semesters, two Monsoon semesters and two Winter semesters for students taking admission in the 1st semester of the program

Provided that a semester or a year may be declared zero semester or zero year in the case of a student if she/he could not continue with the academic programme during that period due to illness and hospitalization, technical grounds like visa problems, sequencing of courses, accepting a foreign scholarship/fellowship provided it is meant for upgrading research skill and not for earning a regular degree or diploma subject to the fulfillment of requirements as laid down by the regulations. Such zero semester/year shall not be counted for calculation of the duration of the programme in case of such a student.

6.2 The Monsoon and the Winter semesters shall commence from and end on a date to be fixed by the Director of the Institute. Normally, Monsoon Semester will run from First Week of August to Second Week of December and Winter Semester will run from First Week of January to Second Week of May including the examinations.

Provided that each semester will ordinarily have 90 working days excluding the examination days.

4. **Credit Requirements**

4.1. The credits requirement for students admitted to the 1st semester of the programme shall be 90.

4.2 (a) Normal load of a student in each of the semesters shall be of *20 credits*.

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(b) A student with the permission of the Program Director may be allowed to carry additional load over and above the normal load prescribed in clause 4.2 (a) above provided that the total load in a semester does not exceed 30 credits.

> *Provided* further that the Program Director may in exceptional circumstances permit the student a load 50% less than a normal load in a semester.

(c) A student with the permission of the Program Director may be allowed to offer courses from the departments other than the four departments jointly running the programme – Department of Linguistics, Department of Statistics, Department of Mathematics and Department of Computer Science.

> *Provided* further that a minimum of 70 credits is earned from the above mentioned four departments for completing the Masters programme, in case of students admitted to the 1st semester.

> *Provided* further that a minimum of 38 credits is earned from the above mentioned four departments for completing the Masters programme, in case of students admitted to the 3rd semester.

4.3 The credit requirements for students admitted to the 3rd Semester of the programme shall be 50.

4.4 The students admitted to the 3rd semester of the programme shall be required to complete the two non-credit courses and introductory courses (offered in the first 2 semesters) from the fields other than those of their previous studies (as recommended by the Program Director and coordinators, based on the entrance test result and other appropriate evaluation). The students will earn additional credits for these introductory courses and will not count into the minimum credit requirement mentioned above.

4.5 A student is allowed to earn extra credits in addition to the minimum prescribed credits

5. Admission Procedure, Intake and Fee Structure

5.1 Procedure for admission to the programme leading to the award of Masters in Computational Linguistics shall be laid down from time to time by the Admission Committee of the Institute.

5.2 The total intake to Masters in Computational Linguistics in the first year of its start shall not exceed 10. This may be increased by upto 20% in the subsequent years (i.e. a maximum of total 12 seats in second year, 15 in third year, 18 in fourth year, 21 in the fifth year and 25 in the sixth and subsequent years after the start of the programme).

> *Provided* that the increase in the number of seats will be a function of the number of application forms received in the following manner. The 20% increase in the seats will be effected provided the programme received application forms in excess of 80% of the total intake in the current year (i.e. at least 18 forms in the second year after the start of the programme, 22 in the third year, 27 in the fourth year, 32 in the fifth year and 38 in the sixth year).

> *Provided* further that there might be an increase of 5% seats for every 20% increase in the application forms (i.e. if the total number of applications forms received in 2nd year is 12 then total seats to be

offered will be 11 and so on; if it is less than 12 then the intake will remain 10 till the year this and further conditions are satisfied).

Provided further also that the maximum intake to Masters in Computational Linguistics shall not exceed 25, notwithstanding the number of forms received for admission to the programme.

5.3. The fee structure of the Masters in Computational Linguistics will be as fixed and notified by the competent bodies of the University.

6. Faculty Adviser

6.1 The Program Director shall appoint an Adviser for students of each year from amongst the members of the faculty concerned. The Adviser shall advise the student about the registration of courses, adding/dropping of courses and how the grades are awarded in the courses.

6.2 Registration of courses is the sole responsibility of a student. No student shall be allowed to do a course without registration and no student shall be entitled to any credits in the course unless she/he has been formally registered for the course by the scheduled date to be announced by the Institute.

6.3 Late registration may be allowed to a student, in exceptional cases subject to the justification given by her/ him, beyond the normal date of registration upto a maximum period of 3 weeks from the date of commencement of semester.

6.4 No student shall be allowed to add a course or substitute a course for another course later than three weeks from the date of commencement of the semester. A student wishing to drop a course must do so as early as possible in no case later than six weeks from the date of commencement of the semester.

7. Evaluation

7.1 The system of evaluation for each lecture and practical course shall be laid down by the Board of the Studies on the recommendation of the Program Director and Coordinators.

7.2 For courses having a semester examination, continuous assessment shall carry 40% weightage, Lab / Project work will carry 30% weightage and the end-semester examination shall carry 30% weightage.

> *Provided* the Board of Studies, on the recommendation of the Program Director and Coordinators, may recommend different pattern of assessment for individual courses.

7.3 The pattern and schedule of continuous assessment for each course of a semester shall be prescribed by the the Program Director and Coordinators, on the recommendation of the concerned course instructor and shall be made known to the students at the commencement of each semester.

7.4 Questions papers for the end-semester examination shall be set by the internal examiner for a course.

> *Provided* the convener of the Board of Studies may get the questions papers set by external examiners in case of shortage of internal examiners

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7.5 There shall be single valuation for all the end-semester examination by internal examiners.

Provided the convener of the Board of Studies may invite external examiners in case number of internal examiners falls short.

7.6 The examination for practical work/ field work/ project work (excluding the project within each individual courses)/ dissertation, wherever the complete course consists of one of these will be conducted jointly by one internal and one external examiner. The grade for such courses will be the average of the grades given by the two examiners.

7.7 The system of evaluation for non-credit and tutorial courses shall be prescribed by the Program Director and Coordinators, on the recommendation of the concerned course instructor and shall be made known to the students at the commencement of each semester. The non-credit courses will only be evaluated as pass/fail.

7.8. If a candidate is not satisfied with the evaluation of continuous assessment or tutorial courses, she/he can approach the Grievance Cell of the concerned department before the commencement of the end-semester examination with a written application together with all facts, the assignments, test papers etc, which were evaluated. The Grievance Cell shall consist of The Registrar (Evaluation) as the ex-officio Convener, one faculty member (other than the course instructor) of the participating department/institute and one external subject expert from outside the University. The grievance cell is empowered to revise the marks if the case is genuine and is also empowered to levy penalty as prescribed by the university on the candidate if her/his submission is found to be baseless and unduly motivated. This cell may recommend taking disciplinary/ corrective action on an evaluator if she/he is found guilty. The decision taken by the grievance cell in such cases is final.

7.9. A student who is not satisfied with the grades in the end-semester examination may apply for a challenge valuation of the answer-sheet. she/he can challenge the grade awarded to her/him by surrendering the grade card and by submitting an application along with the prescribed fee to the Registrar (Evaluation) within 15 days after the announcement of the results. The answer scripts for which challenge valuation is sought for shall be sent to another external examiner appointed by the Convener of the Board of Studies. The final marks awarded will be the higher of the marks obtained in the challenge valuation and in maiden valuation.

7.10 A student shall be deemed to have cleared a course only if she/he has participated in the continuous assessment and has secured an overall grade higher than 'F' in that course (for courses having no end semester examination) or has participated in the continuous assessment and appeared in the end semester examination (for courses having end semester examination) and secured a weighted grade higher than 'F' in that course. A student who fails in a course either by not participating in the continuous assessment and thereby securing an overall grade of 'F' (for courses having no semester examination) or consequently being not eligible to appear in the end semester examination or by absenting from appearing in the end semester examination or by failing to secure a weighted grade higher than 'F' (for course having end semester examination), shall be required to repeat that course or clear another similar (core or optional, as the case may be) course in lieu thereof. A candidate shall be given maximum two opportunities within 3 years to repeat the concerned course provided she/he has appeared in at least one course in the main examination and has fulfilled the minimum requirement of attendance. After 3 years the candidate may be allowed to appear as ex-student.

Provided that the candidate cannot repeat more than 50% of normal workload in a semester. In such

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cases where courses amounting to more than 50% of normal workload needs to be repeated, the candidate shall not be allowed to continue in the programme and her/his name will be automatically removed from the rolls of the University.

7.11 A student who secures a grade higher than 'F' in a course may be permitted by the Institute, keeping in view its academic constraints, to improve her/his grade by repeating that course once, subject to proviso of Clause 7.10 of the Ordinance. Provided further that a student who wants to repeat a course to improve her/his performance shall be allowed to do so only if she/he surrenders her/his earlier grade in the course. Having surrendered her/his earlier grade by due date, it will be her/his repeat performance in the course which will be taken into account to compute the SGPA and the CGPA.

7.8 Examinations shall be conducted under the directions of the Program Director.

7.9 A student can take part in the curricular programme for the Master's Degree of the University to a maximum of six semesters excluding the period of zero semester(s) granted to the her/him by the University.

7.10 An application for admission to the semester examination shall be made in the prescribed form and submitted to the Program Director and shall be accompanied by the following certificates:

  i) Participation in continuous assessment;

  ii) Clearance of all dues.

8. Grade Point Requirement/Minimum standard

8.1 A student joining the 1st semester of the four semester of the programme will be required to maintain a CGPA of 3.00 in the Core Courses at the end of second Semester and thereafter.

8.2 A student, in order to be eligible for the award of Master's Degree of the University, must have (i) passed all the prescribed courses as laid down; (ii) she/he has obtained a CGPA of 4.00 at the end of the programme

Provided that a student may take more optional courses than prescribed in the programme, in which case for the calculation of Final Grade Point Average only the prescribed number of optional courses in the descending order of the grades obtained by the student shall be included. For example, if a programme has 12 compulsory courses and 4 optional courses and a student credits 6 optional courses, her/his Final Grade Point Average shall be calculated on the basis of 12 compulsory courses and the first four optional courses, when all the six are ranked according to descending order of grades obtained by her/him. However, no student shall be permitted to register in a semester only to take an additional optional course.

Provided further that the students of M.Sc. programme who are otherwise eligible for award of degree but have secured a CGPA less than 6.00 at the end of the permissible period of four semesters may be allowed by the Institute to repeat M.Sc. level courses in the 5th and 6th semester, as per provisions contained in Clause 8.11 of the Ordinance, for improvement of CGPA.

9. Courses of Study and Framing of the Syllabi:

9.1 The Courses of study shall be approved by the Board of Studies of the Program, on the recommendations of the Department concerned.

9.2 The detailed Syllabi for the courses shall be approved at the beginning of each semester.

10. Miscellaneous

10.1 All students are required to fulfil the attendance requirements as postulated by the University.

10.2 All students are required to submit requisite admission fees, examination fees and any other fees as and when fixed by the University.

Provided that the tuition fees of the program will be revised every 3 years with an increment of 10% - 20% per semester as a function of the proportion of seats filled up. If all the seats are filled up, the increment will be of 20%. If it is 50% or less then increment is of 10%. There will be a 2% additional fee increase for every 10% increase in the number of filled seats for the program beyond the 50% of total seats. Thus, if total seats filled are more than 50% and upto 60% then increment in tuition fees will be of 12%; if seats filled are more than 60% and upto 70% then increment will be 14%; for >70% and upto 80% it will be 16%; for >80% and upto 90%, it will be 18%; and for above 90%, it will be 20%.

Provided further that if the number of applications received is more than triple of maximum possible number of admissions i.e. 75 applications then upto 30% increment in fees may be carried out.

Provided further also that the number of seats filled will be the average number of students who have taken admission in the preceding 3 years and the number of applications will be the average number of applications received in the preceding 3 years.

Provided further also that a formal feedback is to be taken from any student who drops-out of the program after completing at least one semester of the program and an assessment be made if higher tuition fees is the reason for any drop-out. If such is the case then any further increase in the tuition fees can be done only after making provisions for scholarship / free tuition for the students who are unable to afford the program's tuition fees.

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