

## **PG Diploma Course in Computational Linguistics**

### **Centre for Endangered Languages (CEL)**

#### **GGV, Bilaspur**

#### **Objectives**

The objectives of the course are to provide students with a broad overview of the field and prepare them for further study in computational linguistics and language technologies. This course aims at enabling the students to understand and evaluate the approaches of language processing in relation to various linguistic, computational issues, and applications. It also aims at analyzing the text, context, sentiment or other affective qualities of the people speaking endangered languages. The course may help to facilitate human interaction with machines and software and make the textual and other resources of the internet readily available in multiple languages.


#### **Expected Outcomes:**

1. It will enhance the knowledge base of the students regarding the status of endangered linguistic groups (Tribal communities) in Chhattisgarh.
2. It will enhance the skill levels of the students to pursue research on endangered languages in their future career.
3. The students having knowledge of computational linguistics can find employment in Government and international agencies engaged in preserving the endangered languages of the small communities and their oral literature.

**Medium of Instruction:** The medium of instruction will be in English. .

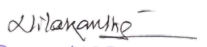
**Attendance:** The student has to secure a minimum of 75 % attendance during the course as per rule.

**Students Intake:** Maximum seats 15 nos.

  
विभागाध्यक्ष/H.O.D.  
मानव विज्ञान एवं जनजातीय विकास विभाग  
Department of Anthropology & T.D.  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
G.G. Ghansidas Vishwavidyalaya, Bilaspur (C.G.)

**Scheme of Examination**

Sl. No.	Code	Title of Paper	Internal Marks	Semester Marks	Total	Minimum Passing Marks
<b>First Semester</b>						
1	CEL-PGD-01	Introduction to Phonetics and Phonology	30	70	100	40
2	CEL-PGD-02	Introduction to Applied Linguistics	30	70	100	40
3	CEL-PGD-03	Computational Linguistics	30	70	100	40
4	CEL-PGD-4	Language Lab of the Centre	30	70	100	50
<b>Second semester</b>						
5	CEL-PGD-05	Socio-Linguistics	30	70	100	40
6	CEL-PGD-06	Endangered Languages in India: An overview	30	70	100	40
7	CEL-PGD-07	Field Linguistics	30	70	100	40
8	CEL-PGD-08	Project work and Data Processing	30	70	100	40

  
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Guru Ghassidas Vishwavidyalaya, Bilaspur (C.G.)

## PG Diploma in Computational Linguistics

**PG diploma in Computational linguistics is aimed at making the student familiar with the basic concepts of linguistics that are necessary and useful in order to enable them interact with specific languages and the computer.**

The **1st paper** of the course Phonetics and Phonology is designed for the students to learn and practice. It aims at acquainting them with the basic theories, phonetics and phonology of language while studying the structure of tribal languages taking these structural characteristics to the machine. This paper also deals with the types of sounds which are articulated in the languages in different kind of articulation and thus the major class and features of the sound systems of a given language. This paper in brief deals with the morpho-phonemic, rules of writing. These theories, concepts and formats will certainly help the students of this course to understand the internal structural linguistic properties of a language helping them to interact with machine using the data collected by them by field work, especially the phonetic and phonological data of tribal languages.

The **2nd paper** Applied Linguistics of the course is more elaborate so that the learner would know and experience the theory of linguistics in studying and analyzing the data properly in an applied manner. This course deals with the three branches of applied linguistics; that is language teaching that helps in analysing the lexical, syntactic and semantic features. In a contrastive manner the Indian education system also takes into account the status of tribal languages in a school education as a medium of instruction, and techniques and methodology which should be involved for teaching and learning process of these neglected languages.

The second branch of applied linguistic – socio-linguistics is dealt with in this part profoundly by adding the multilingual situation in India, where regional languages and sociolects play a pivotal role in human communication. This part also deals with the process of language development that is standardization, modernization and use of regional varieties which are far away in the domain of tribal languages in India. The students after studying the paper may try to collect data from agricultural, artisan, craft, carpentry, painting etc to explain the richness of registers of these tribal languages. This part also has an eye on the use of kinship terms which depict social constructions, the psychological background of the members of these speech communities.

The third important branch of Applied Linguistics is **translation studies and lexicography**. The methods and techniques of both these sub-disciplines are essential to develop and spread a language. In this manner the paper enables the learners to translate their mother tongues in any major language with which he/she is familiar and make dictionaries (Unilingual, bi-lingual) after completing the study of this paper.

In Indian context there are many major or minor languages used by different sort of speech communities, groups and people. They are different in relation to the region, state and linguistic borders. Observing the multilingual situation in India the constitution, census and other

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organizations have status wise categorized these languages. The major languages have been developed corpus wise and status wise by the policy and planning of the Govt. of India. Some of them are kept in the 8<sup>th</sup> schedule of the Indian constitution and many are categorized as unscheduled languages. The students need to be aware about the linguistic realities of India and be aware of the negligible status of tribal languages.

The **3<sup>rd</sup> paper** is designed with a specific objective. It thoroughly deals with the different aspects of CL, like man –machine interface, natural language processing, language engineering, CL and the computer itself. The course is aimed to make students familiar with the basic concepts of CL, so that the students may be familiar with all the models, processes and stages of analyzing the data. This paper is also aimed to make the students familiar with concepts and information regarding the role of computer in speech synthesis, MT and so on. This paper has the main objective to analyze, digitalize and interpret the data collected with the help of these theories, procedures and techniques

The **4<sup>th</sup> paper**, introduces students to the basic techniques of data collection and transcription. They are required to collect data from an informant(s) on various aspects of language being investigated such as phonology, morphology and syntax and work out the basic structural patterns in the languages. Students will also examine the pragmatics and socio-linguistic aspects of the language being analyzed.

The **5<sup>th</sup> paper**, Socio-Linguistics is dealt with in this part profoundly by adding the multilingual situation in India, where regional languages and sociolects play a pivotal role in human communication. This part also deals with the process of language development that is standardization, modernization and use of regional varieties which are far away in the domain of tribal languages in India. The students after studying the paper may try to collect the data from agricultural, artisan, craft, carpentry, painting etc to explain the richness of registers of these tribal languages. This part also has an eye on the use of kinship terms which depict the social constructions, the psychological background of the members of these speech communities.

The **6<sup>th</sup> paper** of the course, an elaborate view is presented in context of the Indian tribal languages which spread in most of the states in more or less numbers. These languages and their detailed description are available in many works done by Governmental and non-governmental organizations. This part of the course also describes the detailed information regarding the tribal languages spoken in different parts of the country. This paper also discusses the shortcomings by which the ELs are not properly given the place in education researches and studies. This paper focuses in making students aware about the situations limiting the scope of these languages to participate and become a part of the main stream. This paper has a potential to make the students feel that the endangerment of tribal languages in India can be easily abolished if the user, the educational institutions and the scholars and intelligentsia feel positively about these languages and come together to preserve, document and make these languages alive through in different domains of communication.

The 7<sup>th</sup> Paper of the course 'Project Work and Data Processing' will be based as 10 days fieldwork in endangered languages of tribal communities of Chhattisgarh. The students will stay in the field along with teachers. There will be two presentations by the students as research proposal and research findings. The seminar will cover 30 marks and dissertation will cover 60 marks. Dissertation will be evaluated by one external/internal examiner.

The 8<sup>th</sup> Paper Computer Laboratory will be acquainting students with advanced softwares related to learning a programming language (Python).

### **1<sup>st</sup> Semester:**

#### **Paper-CEL-PGD-01. Introduction to Phonetics and Phonology- Aims and Objectives: (30+70=100)**

The 1<sup>st</sup> paper of the course Phonetics and Phonology is designed for the students to learn and practice. It aims at acquainting them with the basic theories, phonetics and phonology of language while studying the structure of tribal languages taking these structural characteristics to the machine. This paper also deals with the types of sounds which are articulated in the languages in different kind of articulation and thus the major class and features of the sound systems of a given language. This paper in brief deals with the morpho-phonemic, rules of writing. These theories, concepts and formats will certainly help the students of this course to understand the internal structural linguistic properties of a language helping them to interact with machine using the data collected by them by field work, especially the phonetic and phonological data of tribal languages.

**Unit-1.** Introduction to Phonetics and Phonology.

**Unit-2. Phonetics:**

The anatomy and Physiology of Speech

Initiation of Speech

Articulation

Obstruents

Sonorants

**Unit-3.** Phonetic Transcription: Principle, method and terminology relating to transcription, learning skills of phonemic and phonetic transcription.

**Unit-4. Phonology/Phonemics:**

Phoneme, Allophone,

Segmental and supra-segmental phonemics- stress, Pitch, length, loudness, juncture, intonation.

Phonemic Analysis (Phonemicization, minimal pairs, complementary distribution)

Vowels, Consonants, Morpho-phonology (Connection to morphology, neutralization)

**Unit-5.** Rule Ordering (Rule writing, rule ordering)

(This paper will be connected with the field work and the analysis part will be used with computer.

Both of these may be taken as a part of the project work).

**Reference Books:**

- Bhasker Rao, Peri. 1977. Practical Phonetics. Pune: Deccan Collage.
- Roach, P. 2001. Phonetics. Oxford University Press.
- Bloomfield, L. 1933. Language. New York. Hol & Rinehart and Winston.
- Hocket, C. F. 1958. A Course in Modern Linguistics. New York. Mackmillan & Co.
- Hymn, Larry, M. 1978. Phonology: Theory and Analysis. New York. Holt Rinehart and Winston.
- Less, Roger. 1991. Phonology: An Introduction to Basic Concepts. London. Cambridge University Press.



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**Aims and Objectives:**

The **2nd paper** Applied Linguistics of the course is more elaborate so that the learner would know and experience the theory of linguistics in studying and analyzing the data properly in an applied manner. This course deals with the three branches of applied linguistics; that is language teaching that helps in analysing the lexical, syntactic and semantic features. In a contrastive manner the Indian education system also takes into account the status of tribal languages in a school education as a medium of instruction, and techniques and methodology which should be involved for teaching and learning process of these neglected languages.

The second branch of applied linguistic – socio-linguistics is dealt with in this part profoundly by adding the multilingual situation in India, where regional languages and sociolects play a pivotal role in human communication. This part also deals with the process of language development that is standardization, modernization and use of regional varieties which are far away in the domain of tribal languages in India. The students after studying the paper may try to collect data from agricultural, artisan, craft, carpentry, painting etc to explain the richness of registers of these tribal languages. This part also has an eye on the use of kinship terms which depict social constructions, the psychological background of the members of these speech communities.

The third important branch of Applied Linguistics is **translation studies and lexicography**. The methods and techniques of both these sub-disciplines are essential to develop and spread a language. In this manner the paper enables the learners to translate their mother tongues in any major language with which he/she is familiar and make dictionaries (Unilingual, bi-lingual) after completing the study of this paper.

In Indian context there are many major or minor languages used by different sort of speech communities, groups and people. They are different in relation to the region, state and linguistic borders. Observing the multilingual situation in India the constitution, census and other organizations have status wise categorized these languages. The major languages have been developed corpus wise and status wise by the policy and planning of the Govt. of India. Some of them are kept in the 8<sup>th</sup> schedule of the Indian constitution and many are categorized as unscheduled languages. The students need to be aware about the linguistic realities of India and be aware of the negligible status of tribal languages.

**Unit-1.** Introduction, Definition, Area of Study, application of the theory of linguistics, making linguistics useful, area of applied linguistics, applied linguistics and the related disciplines.

**Unit-2. Language Teaching- Mother Tongue acquisition and second language.** L 1, L 2, L 3., contrastive analysis at lexical, syntactical and semantic level, multi lingual teaching in India and status of tribal languages .

**Unit-3. Sociolinguistics-** Language and society, definition of speech community and basic speech communities in India (unilingual, bi-lingual, multilingual). Regional language and

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sociolect, process of standardization and modernization, registeral varieties, sociology of language (address terms, taboo words, kinship terms, pronouns, naming and their usage), Language Mapping, Questioner making, Pilot Survey (in field work for projects)

**Unit-4. . Language Policy and Language Planning-** Multilingual India and the status of major and minor languages. The works of G.A. Grierson, Census of India 2011 constitution of India Article 343 from 351, language planning (Corpus planning and status planning)

**Unit.5. Translation studies / Lexicography-** introduction and definition, theory of translation and lexicography, Types of Translation, Types of Dictionary, Process of Translation , Process of Dictionaries making, The Role of Contrastive analysis in Translation work and Dictionary making.

### Reference Books:

- Guy Cook, 2003. Applied Linguistics, Oxford University Press.
- Alan Davies, 2007. An Introduction to Applied Linguistics: from Practice to Theory. (2<sup>nd</sup> Edition), Edinburg : Edinburg University Press.
- Alan Davies and Ctherine Elder, 2004, The Handbook of Applied Linguistics, Oxford : Blackwell Publication.
- Srivastava, R. N., 2002, Applied Linguistics, Kalinga: Delhi.
- Pit corder S. 1973. Introducing Applied Linguistics. Hammondsworth: Penguin Books
- Annamalai, E. 1979. (ed.) Language Movements in India, Mysore: CIIL.
- Cooper, Robert L. 1996. Language Planning and Social Change. Cambridge: Cambridge University Press.
- De Varennes, Fernand. 1996. Language, Minorities and Human Right. The Hague: Martinus Nijhoff Publishers.
- Spolsky, Bernard. 2004. Language Policy. New York: Cambridge University Press.
- Nida, E. A., Language Structure and Translation, Stanford University Press.
- Nida and Taper, The Theory and Practice of Translation, Leiden, E. J. Brile.
- Cattford, J. C., Linguistic Theory of Translation, Oxford University Press, London.
- A Course book on Translations, London and New York: Routledge. (Chapters 2-4)- Baker, M : 1972
- Translation and Translating: Theory and Practice, London and New York: Longman, (Chapter 3)- Bell, T.T.
- Machine Translation: post, Present, Future. Chichester: Ellis Horwood Limited (chapter-19)- Hutchins, W. J.: 1986
- Machine Translation: Linguistic Characteristic of MT- Lehrberger, J 1988



**Aims and Objectives:**

The 3<sup>rd</sup> paper is designed with a specific objective. It thoroughly deals with the different aspects of CL, like man –machine interface, natural language processing, language engineering, CL and the computer itself. The course is aimed to make students familiar with the basic concepts of CL, so that the students may be familiar with all the models, processes and stages of analyzing the data. This paper is also aimed to make the students familiar with concepts and information regarding the role of computer in speech synthesis, MT and so on. This paper has the main objective to analyze, digitalize and interpret the data collected with the help of these theories, procedures and techniques.

**Unit-1. Computer Fundamentals-** Introduction to Hardware and software, operating system (windows), database structure and management (DBMS), programming language (Python), Calculating machine, computer for information stages, electric computer, computer with brain analysis, computer languages.

**Unit-2. Computational Linguistics-I:** Introduction, History of CL in Indian context, The interaction between Language and Machine, Artificial Intelligence, Steps of CL (Morphological analyzer, POS tagging, Chunking, Parsing, Semantic Extraction ), Applications of CL (Machine translation, Search Engine (Google, Bing), Information Extraction, Information Retrieval), Approaches: Rule-based approach.

**Unit-3. Computational Linguistics-II:** Relationship between linguistics and NLP, Parsers in NLP, computational model for NLP, Languages engineering, computer application, and Language technology. Speech synthesis and Machine Translation (MT), associative information retrieval testing, computer aided language teaching

**Unit-4. Natural Language Processing-** Formal language, natural language and real language, Natural language as Man-Machine interface, Basic characteristics of NL – Knowledge representation, Frame model, script mo, information format. Function of Natural languages.


**Reference Books :**

- Bird, S. and E. Klien. E. and Loper. 2009. Natural Language Processing with Python. O'reilly Media.
- Bolskov, I. A. and A. Gelbukh. 2004. Computational Linguistics: Models, Resources, Applications. Ciencia De La Computacion.
- Chaitanya, V. and R. Sangal. And Akshar Bharti. 1995. Natural Language Processing: A Paninian Perspective. New Delhi: Prentice Hall of India.
- Hausser, R. R. 2012. Foundations of Computational Linguistics: Human-Computer Communication in Natural Language. Springer.

- Mitkov, R. (ed.). 2005. The Oxford Handbook of Computational Linguistics. Oxford University Press.
- Bird, s. 1995. Computational Phonology: A Constraint-Based approach; Cambridge University Press.
- David G. Hays. 1967. Introduction to Computational Linguistics. American Elsevier Publication Company, Inc. New York.
- Grzybek, P. 2006. Contribution to the Science of Text and Language: Word Length Studies and Related Issues. Springer.

**Paper-CEL-PGD-4: Language Lab of the Centre (30+70=100)**

It is a lab based paper to be developed by the teacher during the course work period.

  
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Dr. Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

## Second Semester:

### Paper- CEL-PGD-05: Socio-Linguistics:

(30+70=100)

#### Aims and Objectives:

The 5<sup>th</sup> paper, Socio-Linguistics is dealt with in this part profoundly by adding the multilingual situation in India, where regional languages and sociolects play a pivotal role in human communication. This part also deals with the process of language development that is standardization, modernization and use of regional varieties which are far away in the domain of tribal languages in India. The students after studying the paper may try to collect the data from agricultural, artisan, craft, carpentry, painting etc to explain the richness of registers of these tribal languages. This part also has an eye on the use of kinship terms which depict the social constructions, the psychological background of the members of these speech communities.

**Unit-1.** Social factors, dimensions and explanations of a language, speech communities and Indian linguistics situation, bilingualism and multilingualism, language maintenance and shifts, language shift in different communities due to limitations in domain.

**Unit-2.** Social factors, dimensions and explanations of language among tribal communities. Language shift in tribal communities due to limitations in domain of language.

**Unit-3.** Sociolinguistic varieties in India – Vernacular languages, link languages, standard languages, lingua-francas, Pidgins (with special reference to Tribal languages), Language and Worldview, Language and cognition.

**Unit-4.** Language Variation- In relation with the user, regional and social dialects, regional variation, social variation, Socio-lect (with special reference to Tribal languages)

**Unit-5.** Variation due to gender and age, social status, social behavior, language change in social situations and speech conditions, language variation due to style, context and register (with special reference to Tribal languages)

#### Reference Books:

- Chambers, J. K. 1995. Sociolinguistic Theory! London: Blackwell.
- Dittmar, N. 1976. Sociolinguistics. London: Edward Arnold.
- Holm, John. Pidgins and Creoles. Vols. I&II. Cambridge University Press.
- Hymes. D. 1974. Foundations in Sociolinguistics, and Ethnographic Approach. Philadelphia University of Pennsylvania Press.
- Fasold, R. 1999. The Sociolinguistics of Language. London: Basil Blackwell.
- Pattanayak, D. P. 1981. Multilingualism and Mother Tongue Education. Delhi: Oxford University Press.

- Singh, U.N. 1992. On Language Development and Planning: A Pluralistic Paradigm. Shimla: Indian Institute of Advance Study.
- Srivastava, R. N. 1994. Bi/Multilingualism, Kalinga. Delhi.
- Wardhaugh, R. 1992. An Introduction to Socio Linguistics, Oxford. Blackwell.
- Hudson, R. A. 1980. Sociolinguistics. Cambridge. Cambridge University Press.
- Fishman, JA. 1972. Advance in the Sociology of Language. Vol. I & II. Mouton: Amsterdam.
- Pandit, P. B. 1972. India as a Sociolinguistics Area, (Gune Memorial Lectures). Pune: University of Poona.
- Hymes, Dell (ed.) 1964 Language in Culture and Society :A reader in Linguistic and Anthropology. New York; Harper & Row.
- Gumperz, J.J., & Hymes, D. (1972) Directions in Sociolinguistics: The Ethnography of Communication. New York: Holt, Rinehart & Winston.
- Hymes, D. (Ed.) (1971) Pidginization and Creolization of Languages. London; Cambridge University Press.
- Hymes, D. (1974). Foundations in Sociolinguistic: An Ethnographic Approach. Philadelphia: University of Pennsylvania Press.
- Gumperz, J.J. 1982 Language and Social Identity. Cambridge University Press.
- Gumperz, J.J. 1955 The Phonology of a North Indian Village Dialect. Indian Linguistic
- Gumperz, J.J. 1957 Language Problems in the Rural Development of North India. Journal of Asian Studies.
- Gumperz, J.J. 1957 Notes on the Phonology of Mundari. Indian Linguistics 17:6
- Gumperz, J.J. 1957 Some Remarks on Regional and Social Languages Difference in India in M. Singer (ed.), Introduction to Indian Civilization, pp.31-38

## Paper- CEL-PGD-06: Endangered Languages in India: An overview

(30+70=100)

### Aims and Objectives:

The 6<sup>th</sup> paper of the course, an elaborate view is presented in context of the Indian tribal languages which spread in most of the states in more or less numbers. These languages and their detailed description are available in many works done by Governmental and non-governmental organizations. This part of the course also describes the detailed information regarding the tribal languages spoken in different parts of the country. This paper also discusses the shortcomings by which the ELs are not properly given the place in education researches and studies. This paper focuses in making students aware about the situations limiting the scope of these languages to participate and become a part of the main stream. This paper has a potential to make the students feel that the endangerment of tribal languages in India can be easily abolished if the user, the educational institutions and the scholars and intelligentsia feel positively about these languages and come together to preserve, document and make these languages alive through in different domains of communication.

**Unit-1.** Meaning, Concept of Endangered Languages (ELs), its development and growth, Factors causing a language endangered.

**Unit-2.** The statistical study of Endangered Languages (ELs) in India (State wise)  
The Indian Endangered Languages (ELs) as listed by UNO, Govt of India, and other individuals or semi-Govt. organizations.

**Unit-3.** The societal and cultural features of the tribal communities who speak the tribal languages, Origin, growth and development, categories Endangered Languages in India.

**Unit-4.** The main Endangered Languages (ELs) of Central India, Classifications, distribution across States. The studies and works available on tribal languages of India in general and especially in Central India.

**Unit-5.** The Constitutional status of Tribal languages in the Constitution of India,

### References:

- Dittmar, N. 1976. Sociolinguistics. London: Edward Arnold.
- Holm, John. Pidgins and Creoles. Vols. I&II. Cambridge University Press.
- Hymes. D. 1974. Foundations in Sociolinguistics, and Ethnographic Approach. Philadelphia University of Pennsylvania Press.
- Pattanayak, D. P. 1981. Multilingualism and Mother Tongue Education. Delhi: Oxford University Press.
- Singh, U.N. 1992. On Language Development and Planning: A Pluralistic Paradigm. Shimla: Indian Institute of Advance Study.

**Aims and Objectives:**

The **4th paper**, introduces students to the basic techniques of data collection and transcription. They are required to collect data from an informant(s) on various aspects of language being investigated such as phonology, morphology and syntax and work out the basic structural patterns in the languages. Students will also examine the pragmatics and socio-linguistic aspects of the language being analyzed.

**Unit-1.** Primary source- Field Survey in different linguistic zones of Chhattisgarh.

**Unit-2.** Secondary Survey-Historical, Archeological, Geographical and Ethnological Records.

**Unit-3.** Data Type and Data Sources-Qualitative and quantitative data, Oral and written record sources.

**Unit-4.** Data Analysis-Phonemics, Morphological, Symantec, Syntactic.

**Unit-5.** Report Preparation. Preparation of Linguistic Maps and Graphs.

**Reference Books:**

- Abbi, Anvita. 2001. A Manual of Linguistic Field Work and Indian Language Structures, Munich: Lurom Europ.
- Briggs, Charles L. 1986. Learning how to ask: a sociolinguistic appraisal of the role of the interview in socio science research. Cambridge: Cambridge University Press.
- Burluig, Robbins. 2000. Learning a field language. Prospect Heights. Llinois: Qaveland Press.
- Hocket, C. F. 1958. A Course in Modern Linguistics. New York. Macmillan.
- Ladefoged, P. 2003. Phonetic data analysis: An Introduction to field work and instrumental techniques. Oxford: Blackwell.

**Paper- CEL-PGD-08: Project work and Data Processing (It will be based on endangered languages data) (30+70=100)**

- Field work
- Making of word list and other lexical categories
- Contrastive study at all linguistic levels
- Electronic dictionary
- Machine translation of words and simple sentences
- Morphological analyzer and generator