Prospectus for programme in Audiology at Lund University  
Set out by the Board of the Faculty of Medicine June 17 1998

1 GENERAL INTRODUCTION

The activities of Universities and of colleges of Higher Education are regulated by the Higher Education Act (SFS 1992: 1434) and the Higher Education Ordinance (SFS 1993:100) which came into force on July 1 1997.

Audiology studies at Lund University are governed by:

- the regulations as set out in the relevant sections of Higher Education Acts and Higher Education Ordinances
- the regulations set out below in points 3-8

2 GUIDELINES FOR STUDIES AT COLLEGES OF HIGHER EDUCATION

Basic studies in higher education are, over and above promoting knowledge and skills, designed to give students the ability to carry out independent, critical assessment, to carry out independent problem solving, as well as following up skill development as determined by the areas covered by the studies in question. The studies are also to develop students’ abilities to exchange ideas and information at a scientific level.

3 OVERALL OBJECTIVES FOR AUDIOLOGY STUDIES AT LUND UNIVERSITY

To be awarded the 240 credits, which constitute a degree in audiology the student, must have

- acquired the ability to investigate and contribute to a diagnosis of impaired hearing in children, adolescents and adults as well as proved capable of assessing the potential for habilitation/rehabilitation of a technical and pedagogical nature.
- acquired the ability to draw up individual rehabilitation programmes of a technical, pedagogical and psychosocial nature as well as the ability to plan, execute and evaluate individual and group treatment programmes.
- acquired an insight into the importance of hearing in the development of communication, the understanding of speech and language, the learning process and social integration.
- matured in the process of acquiring self-knowledge and empathy and consequently been able to create good working relationships with patients and their relatives whilst being able to combine ethical considerations with the ability to see people as a whole.
- acquired the capability to identify those factors which can affect hearing impairment as well as be acquainted with, and provide information about, potential preventive measures which are available with the aim of preventing the origin of damage to the hearing.
- acquired the ability to carry out, both independently and in collaboration, research and development work.
4 THE CONTENTS OF THE AUDIOLOGY PROGRAMME

Basic studies comprise 8 terms of full-time studies, the equivalent of 240 credits, of which 30 correspond to psychology, 30 to phonetics, 30 to technology and 150 to audiology. See appendix for specification of points.

Basic theoretical instruction is given in the following areas: audiology, psychology, linguistics, phonetics, technology, pedagogy and relevant areas of medicine which are of importance in the diagnosis and treatment of hearing impairment. Theory and clinical teaching are brought together and students’ own skills are furthered partly through a topic-based course content and partly through the teaching model, problem-based learning (PBL).

The clinical/practical part of the programme deals extensively with audiological methodology through auscultation, diagnostics and treatment. In the latter part of the programme the students undergo work experience as an audiologist in all areas related to the profession. Parts of the clinical/practical work are arranged away from the normal place of study.

The practical training of the programme are designed to develop the individual student’s self-knowledge and empathy through observation and analysis of his/her own communicative skills and through knowledge of the epistemological standpoint. A therapeutic attitude is developed by practical and theoretical studies as well as frequent discussion. In addition, the student will develop practical skills in conversation techniques and leadership.

Epistemology and thesis work are essential elements of the course which allow the student to develop the ability to develop a scientific viewpoint, thereby promoting the ability to think critically. Practice in scientific methodology is provided through laboratory work, observation and seminars as well as empirical work.

5 SPECIFIC OBJECTIVES OF AUDIOLOGY STUDIES AT LUND

The programme is divided into three parts. The basic year – terms 1 and 2, the profile years – terms 3 to 6 and the year of advanced studies – terms 7 and 8.

Basic year – terms 1 and 2

Designed to provide the student with basic knowledge of normal human communication, partly through theoretical studies in linguistics, phonetics and psychology with practical work using descriptive models in the above-mentioned areas, partly through practice in communication skills. The student learns about the organisation, structure and mechanics of language as well as communicative functions, alternative methods of communication and the structure of dialogue/conversation. The anatomy and function of the organs of speech, voice and hearing are dealt with as are the production, perception and acoustics of speech and voice.

An introduction to the anatomy and function of the organs of speech, voice and hearing, and to related technical subjects is given with special emphasis on basic acoustics and signal processing.

Psycho / sociolinguistic aspects of human communication are discussed. Theories surrounding personality and sociopsychology are studied. Proficiency in sign language is introduced in term 2 and continues from terms 3 to 8.
Profile years – terms 3 to 6.

The student studies the causes, assessment and treatment of different audiology diagnoses in children and adults. This is done through the application of, and specialisation in, theoretical and practical elements of the course dealing with audiology, the anatomy of the hearing organs, physiology and pathophysiology, otoneurology, neuroanatomy, the theory of perception, psychology, acoustics, signal processing and technical audiology.

In connection to paediatric audiology the student examines embryology, paediatrics and neuropaediatric aspects of children born with serious disability, and the normal and deviant development of communication in children. Teaching and schooling methods to help children with varying degrees of hearing impairment are examined.

Geriatrics and dementia are studied in connection with rehabilitation of adults. Communication in functionally disabled adults is examined in detail as are perceptual disorders of speech and language.

Special emphasis is placed on different methods and models designed to carry out and evaluate habilitation/rehabilitation in order to provide an overall perspective in future employment.

Auditiv prevention is studied as well as noise and noise prophylaxis and special attention is given to hearing impairment in a work environment and the role of society at large is highlighted.

Great importance is placed during the five clinical/practical terms on the following: practical management of people with impaired hearing, ethical questions, therapeutic attitudes, providing diagnoses, pedagogic and psychosocial measures, aids for the hearing impaired, record keeping, teamwork etc. Diagnosis and habilitation/rehabilitation methods are examined in detail and are evaluated in light of performance and result.

With the aid of supervision and good working practice the student will be given time to acquire knowledge of subjects relating to the central elements of audiology: preventive audiology, clinical audiology with reference to examination and treatment, care of the disabled, teaching and company culture.

Year of advanced studies – terms 7 and 8.

During the last two terms the student’s time will mostly be spent on writing, documenting and finding evidence for a scientific thesis work. Clinical/practical skills will be furthered through work experience as an audiologist, preferably away from the normal place of study. Work experience will be documented and discussed during clinical seminars.

6 HOW THE PROGRAMME IS STRUCTURED.

Each term consists of a number of individual courses and examinations. At the same time the course is process oriented and designed to become more advanced and specialised. Over the terms the course content is combined with audiological studies regarding children and adults.

Five departments contribute to the audiology degree: speech pathology/phoniatrics, linguistics (phonetics and general linguistics), psychology, structural engineering (engineering acoustics) as well as applied electronics (department of signal processing). The course content specifies the department responsible for each course/examination.

The basic year provides the student with a general introduction to the subject areas relevant to an audiologist through studies/courses taken at the five departments.
The profile years focus mainly on diagnostic measurement and technical /pedagogical habilitation/rehabilitation, and courses are followed at the departments of speech pathology/phoniatrics, psychology, engineering acoustics and applied electronics.

The final year represents a more in-depth programme to develop clinical/practical skills through work experience as an audiologist and through thesis work.

Points are awarded as follows:

- Linguistics/phonetics: 30 credits
- Psychology: 30 credits
- Acoustics/signal processing: 30 credits
- Audiology: 150 credits
  - Theoretical courses: 90 credits
  - Clinical/practical courses: 30 credits
  - Thesis work: 30 credits
Term 1

AUD111  Introduction to normal and deviant communication, 9 credits

9801  Introductory course – communication (4.5 credits)

speech pathology /phoniatrics, linguistics, engineering acoustics/signal processing

Theories of communication. Information regarding communication and communication disorders. Terms of disability and historical background. Information regarding audiological working practices and conditions. Introduction to audiology and speech pathology. Medical ethics. Practical skill development through interviewing, observations, auscultation, recording of audio and video tapes. Introduction to computer technology and scientific articles.

9802  Behavioural observation (1.5 credits)

speech pathology /phoniatrics, psychology and linguistics.

This element represents practical application of courses AUD111-115 and leads to a written account from a video recorded conversation. Verbal and non-verbal communication and psychological observation variables are described.

AUD112  Linguistics, 7.5 credits

9803  Linguistics (7.5 credits)

linguistics

Basic characteristics of human language. Similarities and differences between human language and other systems of communication. Theories and models of analysis for natural speech communication. Analysis models for non-verbal communication.

AUD113  Signal processing I, 3 credits

9804  Signal processing I (3 credits)

signal processing

Periodic signals and their characteristics (amplitude, frequency, phase etc.) RMS values and decibels. Spectral description of periodic/transient signals. Practical measurement of the length and frequency of a signal.

AUD114  Acoustics I, 4.5 credits

9805  Acoustics I (4.5 credits)

engineering acoustics


AUD115  Human development I, 9 credits

9806  Human development I (9 credits)

psychology

Personality and sociopsychological basic terminology studied in relation to normal development crises and psychic health. The link between psychic factors and biological/social courses of events. Development of, and basic terms surrounding, gender roles. Different types of family patterns and factors which affect their origin. Theoretical viewpoints regarding inter and intrapsychic courses of events. Behaviour observation. Practical skill development in psychological observation methods. Motivation, cognition and memory.
Term 2

AUD116  Anatomy and physiology, 4.5 credits

9807  Anatomy and physiology (4.5 credits) speech pathology /phoniatrics
General terminology in anatomy and physiology. The function and anatomy of the speech, voice and hearing organs.

AUD117  Phonetics, 15 credits

9808  Phonetics (15 credits) linguistics, speech pathology /phoniatrics
Speech communication

Source/filter function.

Auditive and visual systems of perception.

AUD118  Human development II, 7.5 credits

9809  Human development, II (7.5 credits) psychology

AUD111  Introduction to normal and deviant communication, 9 credits, cont.

9810  Diagnostic measurement methods (3 credits) speech pathology /phoniatrics

9811  Practical training (no credits) speech pathology /phoniatrics
Term 3

AUD211  Normal and deviant development in children, 12 credits

9812  General neuroanatomy, paediatrics, neuropaediatrics, embryology (3 credits)
speech pathology /phoniatrics.

9813  Normal and deviant development of communication in children, (4.5 credits)
speech pathology /phoniatrics, linguistics


9814  Communication in children with multiple disabilities (4.5 credits)
speech pathology /phoniatrics

Aetiology, diagnosis and treatment in instances of physical malformation such as cleft-lip and palate. The effectiveness of audiology compared to that of orthodontics, speech pathology, phoniatrics and plastic surgery.

AUD212  Sensorineural hearing impairment, 13.5 credits

9815  Introduction to audiological assessment and treatment (9 credits)
speech pathology /phoniatrics

9816  Sensorineural hearing impairment (4.5 credits) speech pathology /phoniatrics
9817 Practical training (no credits) speech pathology /phoniatrics
Audiological laboratory work: pure-tone -and speech audiometry, OAE, BRA, EcoG and phase
audiometry. Interpretation and summary of assessment results. Clinical seminars involving
presentation of the student’s own patient cases. Auscultation within hearing aid fitting. Sign
language.

AUD213 Audiological assessment – clinical/practical teaching, 4.5 credits

9818 Audiological assessment – clinical/practical teaching (15 days, 4.5 credits)
speech pathology /phoniatrics
Basic diagnostic measurement: tone -and speech audiometry, OAE, BRA, EcoG, and phase
audiometry conducted under supervision. Hearing screening in children with speech disorders.
Term 4

AUD214     Conductive and non-organic hearing impairment, 12 credits

9819   Neuropsychology, neurolinguistics and neuroaudiology (4.5 credits)
speech pathology /phoniatrics, psychology, linguistics

Neuropsychological, neurolinguistic and neuroaudiological basic terminology. Advanced study of
neuroanatomy in relation to functional systems/modalities. Examination methods. Peripheral and
central retardation in speech and language perception. Psychoacoustics. Acoustic analysis and
perception theory.

9820     Conductive hearing impairment. Non-organic hearing impairment (3 credits).
speech pathology /phoniatrics

Conductive hearing impairment depending on otosclerosis, otitis, otosalpingitis and disorders of
Aetiology, symptoms, examination methods, treatment models: medical, technical, psychological,
 social and communicative aspects.

9821     Audiological intervention (4.5 credits) speech pathology /phoniatrics

Methodology, interpretation and needs analysis of conductive impairment and non-organic hearing
impairment. Planning for medical intervention. Teamwork. Hearing aids. The audiologist’s role in
therapy and pedagogy. Appropriate measures in physical and social environments.
Diagnostic measuring methods such as measurement of acoustic immittance and derivation tests.
BRA and Cortical Response Audiometry (CRA). Specific hearing tests in children and methods of

9822   Practical training (no credits)

Audiological laboratory work. Measurement of acoustic immittance, BRA, CRA and derivation
tests. Hearing tests in children. Interpretation and summary of assessment results. Screening

AUD215     Signal processing II, 12 credits

9823     Signal processing (12 credits) signal processing

Signals and systems. Characterisation of linear systems in terms of impulse response or
frequency/phase function. Filtering. The organ of speech as an example of a linear system.
Time/frequency description of speech signals. Non-linear systems and their application within the
area of hearing aid technology. Digital signals and related terms such as sampling, quantification,
reconstruction. Examples of digital systems within audiology (hearing aids, analysis of otoacoustic
emissions, cochlear implantation technology etc.)

AUD216     Audiological intervention - clinical/practical teaching, 3 credits

9824   Audiological intervention clinical/practical teaching (10 days, 3 credits)
speech pathology /phoniatrics

Audiological measuring methods: pure-tone and speech audiometry, measurement of acoustic
immittance, BRA, CRA and derivation tests conducted under supervision. Paediatric audiological
assessments.

AUD217   Empirical work, 3 credits

9825   Empirical work (3 credits) linguistics, speech pathology /phoniatrics

Epistemology – an introduction. Short composition subject to be chosen by the student. The
purpose is to teach the student how to plan and carry out an empirical study.
Term 5

AUD311 Neurological communication disorders in adults, 6 credits

9826 Neurology, geriatrics and dementia (3 credits) speech pathology /phoniatrics

9827 Communication in adults with multiple disabilities (3 credits) speech pathology /phoniatrics
Afasia, dysarthria and non-linguistic neuropsychological disorders after damage sustained by adults. Communication in mentally retarded adults. Common symptoms of brain damage such as agnosia, apraxia, perceptual disorders, acalculia, alexia and behaviour influence. Practical test methodology for neurological damage. Ways of communication and aids for speech, language and hearing damage. Community care available to the mentally retarded.

AUD312 Audiological intervention - advanced audiology, 15 credits

9828 Advanced audiology (3 credits) speech pathology /phoniatrics
Specific audiological standpoints concerning hearing-related conditions such as tinnitus, perceptual hearing problems and hyperacusis. Specific methods of treatment for cochlear implants, semi-implantable hearing aids and bone conducted hearing aids.


9829 Audiological contributions to habilitation/rehabilitation. (12 credits) speech pathology /phoniatrics

9830 Practical training (no credits) speech pathology /phoniatrics

AUD313 Audiological habilitation and rehabilitation, clinical/practical teaching, 6 credits

9831 Audiological rehabilitation and rehabilitation, clinical/practical teaching (20 days 6 credits) speech pathology /phoniatrics
Under supervision students are responsible for the treatment of patients in need of technical habilitation/rehabilitation. Preliminary discussion and development of rehabilitation programmes. Testing and customising of hearing instrument and related equipment.
AUD314  Psychology of personal interaction in treatment situations, 6 credits

9832  Psychology of personal interaction in treatment situations, part I (3 credits)

Term 6

AUD314 Psychology of personal interaction in treatment situations, 6 credits, cont.

9833 Psychology of personal interaction in treatment situations, part II (3 credits) psychology
Group supervision of the students’ own clinical/practical work.

AUD315 Acoustics II, 10.5 credits

9834 Acoustics II (10.5 credits) engineering acoustics

AUD316 Audiological prevention – medical areas phoniatrics/psychiatry, 13.5 credits speech pathology /phoniatrics, linguistics

9835 Voice and speech disorders. (3 credits) speech pathology /phoniatrics, linguistics

9836 Audiological prevention (4.5 credits) speech pathology /phoniatrics

9837 Advanced audiological habilitation and rehabilitation of adults (5.25 credits) speech pathology /phoniatrics

9838 Psychiatry (0.75 credits) speech pathology /phoniatrics
Basic terminology in psychiatry – neuroses, psychoses etc. Causation theories, symptoms and treatment alternatives e.g. psychotherapy, forms of crisis therapy. Models of family therapy. Pharmacology. Different types of psychiatric illness in relation to communication disorders. Legislation. Psychosomatic disorders.

9839 Practical training (no credits) speech pathology /phoniatrics
Students train their own voices. Clinical seminars. Auscultation. Signing as a support for hearing loss. Sign language.

AUD317 Advanced audiological habilitation/rehabilitation Clinical /practical teaching, 3 credits

9840 Advanced audiological habilitation and rehabilitation Clinical/practical teaching (10 days, 3 credits) speech pathology /phoniatrics
Term 7

AUD411 Differential psychology, test methodology, statistics and experimental studies, 5.25 credits

9841 Differential psychology, test methodology, statistics and experimental studies (5.25 credits) psychiatry, speech pathology /phoniatrics

Differential psychological theories regarding differences in sex, age, intelligence, levels of maturity and health. Devising, standardising and evaluating tests as well as the differences in test types. Test scales. Statistical terminology and how to set up scientific experiments. Differences between qualitative and quantitative methods. Elementary statistical methods in standard audiological literature. Practical skill development in the use and assessment of different test and examination types.

AUD412 Paediatric audiology – advanced, 11.25 credits

9842 Specific problems in paediatric audiology (4.5 credits) speech pathology /phoniatrics

Cochlear implant, ear canal atresia, multiple disabilities in children, acquired hearing impairment, profound hearing impairment and other specific problems affecting children.

9843 Audiology – hearing development in children (6.75 credits) speech pathology /phoniatrics

Linguistic and cognitive development in children of school age. Normal and deviant development of the ability to read and write. Learning difficulties in relation to primary hearing and/or language disorders. Hearing instruments and related equipment available in the learning process. Quality of life and communication in pre-postlingual profound hearing impaired children, adolescents and adults. Public education. The organisation of teaching for the profound hearing impaired and deaf, content and methods used. Pedagogical contributions. Study visits to schools for the profound impaired and deaf. Quality of life and communication for the hearing impaired child (family, studies, work, free time). Pedagogical measures. Acquired versus congenital hearing impairment and profound hearing impairment. Visiting work.


9844 Practical training (no credits) speech pathology /phoniatrics

The audiologist’s pedagogical work. Information in groups. Clinical seminars. Sign language.

AUD413 Clinical/practical teaching, 4.5 credits

9845 Clinical/practical teaching (15 days, 4.5 credits) speech pathology/phoniatrics

Group treatment. Optional, specially tailored advanced practical element.
AUD414  Thesis work (30 credits)

9846  Thesis work (30 credits) speech pathology/phoniatrics

(a) Different scientific viewpoints concerning phonetics, linguistics, psychology, technology, medicine, speech pathology and audiology. Researchers conducting ongoing research into areas related to audiology present their findings. Ethical considerations regarding human research. Advanced lectures/seminars. Critical scrutiny and evaluation of scientific articles. Choice of topic for thesis work at a Master's degree level.

b) Setting out of a scientific, empirical essay. Participation in seminars continues while the work is in progress. Discussion with supervisors.

c) Completion of scientific, empirical essay which represents 20 weeks’ work. Participation on seminars continues in order to present current research, discuss articles read and giving an account of the work in progress. Final seminars on the scientific paper with opponents.
Term 8

AUD414    Thesis work - see AUD414

AUD415    Advanced clinical/practical work, 9 credits

9847      Advanced clinical/practical work (30 days, 9 credits) speech
pathology/phoniatrics

Six weeks’ consecutive work experience with a certain degree of supervision at an audiological centre or another area of audiology, preferably away from the normal place of study. Work experience should be on a full-time basis. The student arranges a place in conjunction with programme leaders and is to meet any extra expenses incurred him/herself.

Clinical/practical seminars with written and oral presentation of cases encountered during work experience.
7   TEACHING METHODS/METHODS OF INSTRUCTION

The Audiology programme at Lund University is based extensively on problem-based learning (PBL). Other methods are used during the basic year. Problem-based learning means that the student’s learning process is directly linked to patient cases or problems.

Attendance and participation in lessons is compulsory and the student is continually assessed.

The following teaching methods are used:
- **Tutorial.** The student works in a group of 6-9 members with a tutor/supervisor and the group will meet at least once a week.
- Teacher-led **lessons/lectures** are given in those areas where the student has no knowledge on which to draw on, or as a complement to PBL. Whole class teaching.
- **Student or teacher-led seminars.** Whole class teaching.
- Teacher or student-led **laboratory work/practical skill development.** Accounts to be presented in written or oral form. Usually a group of 3-9 students.
- **Auscultation/observations.** Reports given in written or oral form. Groups of 1-3 students.
- **Study visits.** Observation of different activities which are connected to audiology. Accounts to be presented in written or oral form. In groups or individually.
- **Clinical/practical teaching.** Diagnostic measurements and technical-pedagogical habilitation/rehabilitation of the student’s own patients or execution of another type of audiological work under a audiologist’s supervision.

8   TESTING

The student’s knowledge and skills are continually assessed on a written and oral basis as regards theoretical, practical and clinical parts of the programme. Great emphasis is placed in the student’s attitude to therapy as well as his/her ability to transfer theoretical knowledge to practical skills in dealings with patients. The student is awarded a pass or fail grade in the different parts of the programme.

9   MATRICULATION CERTIFICATE AND DEGREE CERTIFICATE.

Once the student has participated in, and been passed in, all parts of the course, he/she will be awarded a university matriculation certificate. The degree certificate awarded in conjunction with this is a “Master of Science (MSc) in Audiology”.