Neuroscience Technology Program

Students Handbook

برنامج تقنية علوم الأعصاب

كتيب الطالبات

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Program History

The Neuroscience Technology Program at Imam Abdulrahman bin Faisal University (IAU) was established in September 2017, making it the first program of its specialty not just in Saudi Arabia but also in the entire Middle East. This pioneering initiative, spearheaded by the College of Applied Medical Sciences in Jubail, was a response to the growing demand for skilled Neuroscience technologists in Saudi Arabia. By taking this step, IAU has positioned itself at the forefront of future developments in the field of Neuroscience Technology.

The department of Neuroscience Technology offers a comprehensive four-year Bachelor's program exclusively for female students. Alongside the academic curriculum, students also undergo a year of internship training in a clinical setting. The program structure comprises a preparatory year followed by three years of specialized studies Relevant to the clinical and technical aspects of the Neuroscience field. It covers a wide range of topics, employing a multidisciplinary approach to understanding the nervous system. Students delve into areas such as fundamental principles of neuroscience, and gain proficiency in hands-on experience in working with cutting edge laboratory techniques.

The overarching goal of the Neuroscience Program is to graduate highly skilled and well-rounded Neuroscience Technologists. The program equips students with a solid foundation in the fundamental principles of neuroscience, as well as contemporary concepts and advancements in the field. This knowledge enables graduates to contribute effectively to the diagnosis and assessment of diseases. Additionally, students become skillful in operating state-of-the-art neurodiagnostic medical equipment, ensuring their competence in utilizing cutting-edge technology in their professional practice.

Program Organizational Structure
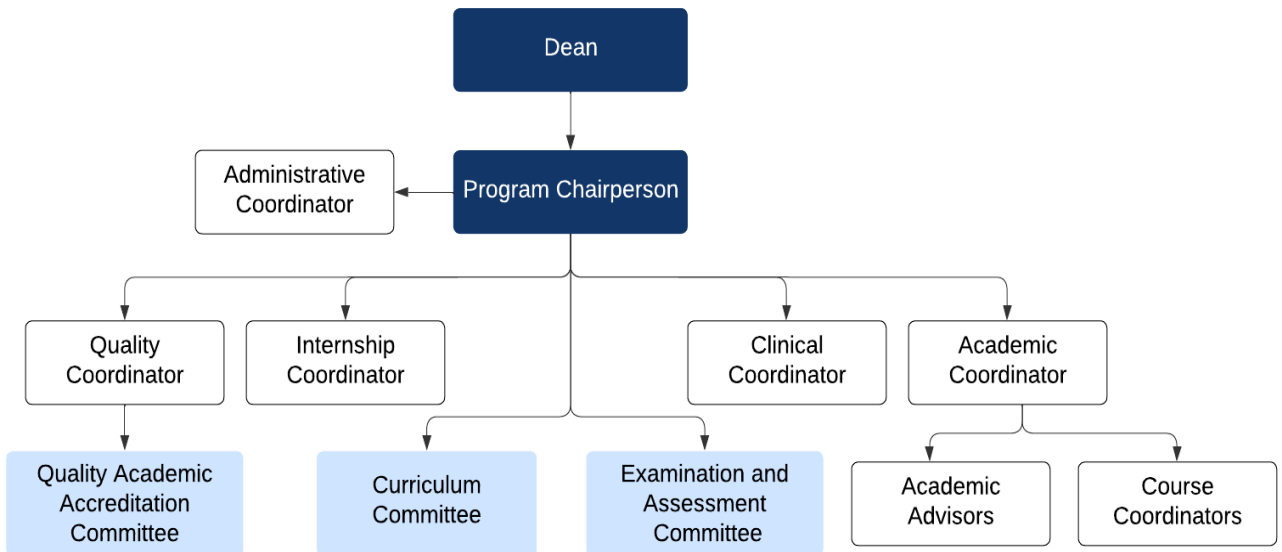
Vision, Mission & Values

Vision

A Neuroscience Technology program distinguished nationally and internationally for its excellence in teaching and learning, research, and community engagement.

Mission

To graduate competent neuroscience technologists capable of providing state of art patient centered care, conducting innovative research in basic and clinical Neuroscience, and serving the community through promoting social responsibility and effective community partnership.

Values

Lifelong learning, Professionalism, Distinction, Accountability, Collaboration & Teamwork, Empathy, Social responsibility

Program Goals

The program goals to compliment the mission statement of the Neuroscience Technology department as follows:

Goal 1: Provide high quality education in Neuroscience Technology.

Goal 2: Prepare Neuroscience Technologists that meet regulatory standards and exhibit ethical behaviour and code of conduct.

Goal 3: Promote Scientific Research in the field of Neuroscience Technology and labor market.

Goal 4: Promote social responsibility with effective community partnership.

Program Learning Outcomes

As per the national qualifications framework (NQF) there are 3 domains of learning – Knowledge, cognitive skills, and values.

KNOWLEDGE

K1   Recognize anatomical and pathophysiological features of various neurological conditions.

K2   State the concepts and principles of different procedures in the neurodiagnostic field.

K3   Describe accurately neurodiagnostic findings.

SKILLS

S1   Integrate neurodiagnostic principles using critical thinking, analytical, problem solving, and decision-making skills to develop effective patients' management plans

S2   Operate precisely neurodiagnostic instruments and related medical devices

S3   Develop applied research in the field of neurodiagnostic practice & continuous professional development.

S4   Communicate effectively for exchange of concepts and technical skills

S5   Utilize technology effectively to manage, interpret, and apply health services data

VALUES

V1   Demonstrate professionalism with adherence to ethical and legal standards of the health care profession.

V2   Demonstrate active participation in community development with high respect to cultural diversity

Program Graduate Attributes

NST program graduate attributes (GAs) are aligned with IAU GAs. NST GAs are as follow:

1. Devoted to the Islamic identity demonstrating ethical, legal, and cultural values
2. Demonstrates social responsibility
3. Committed to continuous learning and development within the field of NST
4. Exhibits professionalism and effective communication skills
5. Assumes leadership roles and characteristics with an ability to encourage and collaborate with team members
6. Demonstrates initiative and determination
7. Competent critical thinker with efficient problem-solving skills
8. Employs digital, numerical and information technology towards the field of NST

Program Admission Requirements

The student must successfully pass the preparatory year. The University Council determines the number of students to be admitted based on the recommendation presented by the College Council. Acceptance to the program is based on the available vacancies and GPA.

Refer to Rules and regulation link from Imam Abdulrahman bin Faisal University by logging onto the website https://admitportal.iau.edu.sa/web/. Refer to admission link from Imam Abdulrahman bin Faisal University click here or log onto the website: - https://admitportal.iau.edu.sa

Faculty*

Name	Position	Email	Extension
Prof. Mohammed El-magzoub	Professor	msmali@iau.edu.sa	38625
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* Kindly refer to the CAMSJ faculty website for additional information and the latest updates on the Neuroscience Technology program.

Program Study Plan

Level	Course Code	Course Title	Pre-Requisite Courses	Credit Hours	Type of requirements
Level 1	ENGL 101	General English Language	NONE	5	College
	BIOL 102	Biology		2	College
	CHEM 103	Chemistry		1	College
	PHYS 104	Physics		1	College
	PHEDU 162	Health and Physical Education		1	College
	ISLM 181	Creed and Family in Islam		2	Institution
Level 2	ENGL 101	General English Language	NONE	5	College
	BIOL 102	Biology		2	College
	CHEM 103	Chemistry		1	College
	PHYS 104	Physics		1	College
	COMP 111	Computer Skills		2	College
	LRSK 141	Learning and Searching Skills		2	College
	ARAB 182	Arabic Language Skills		2	Institution

Program Study Plan

Level	Course Code	Course Title	Pre-Requisite Courses	Credit Hours	Type of requirements
Level 3	ENGL 102	English for Academic and Specific Purpose	NONE	3	College
	BIOL 102	Biology		3	College
	CHEM 103	Chemistry		2	College
	PHYS 104	Physics		2	College
	LRSK 142	Communication Skills		2	College
Level 4	ANAT 201	Anatomy	NONE	3	College
	PHYL 202	Physiology		3	College
	NEURT 201	Electronics and Instrumentations for Electro neurophysiology		3	Department
	ISLM 282	Islamic Ethics and Values		2	Institution
Level 5	HIST 281	History and Civilization of KSA	NONE	2	Institution
	MICRO 205	Microbiology and Infection Control	NONE	2	College
	NEURT 208	Neuroanatomy	ANAT 201	3	Department
	NEURT 209	Neurophysiology	PHYL 202	3	Department

Program Study Plan

Level	Course Code	Course Title	Pre-Requisite Courses	Credit Hours	Type of requirements
Level 6	NEURT 202	Introduction to Clinical Neurophysiology Profession	NONE	2	Department
	NEURT 207	Basic Clinical Assessment	ANAT 201 PHYL 202	3	Department
	PATH 210	Introduction to Pathology	PHYL 202	3	Department
	PHARM 211	Pharmacology	NONE	3	Department
Level 7	NEURT 301	Central Nervous System Disorders	NEURT 208	3	Department
	NEURT 302	Electroencephalogram I	NEURT 201 PATH 210	4	Department
	ETHIC 213	Bioethics	NONE	2	Department
	PSYCO 206	Behavioral Sciences	NONE	2	College
	NEURT 303	Imaging and Sonography	NONE	2	Department
Level 8	NEURT 304	Clinical Practice I	NEURT 207	3	Department
	NEURT 308	Electroencephalogram II	NEURT 302	3	Department
	NEURT 310	Neuromuscular Disorders	NONE	3	Department
	BUS 381	Entrepreneurship	NONE	2	Institution

Program Study Plan

Level	Course Code	Course Title	Pre-Requisite Courses	Credit Hours	Type of requirements
Level 9	NEURT 307	Evoked Potentials 1	NONE	3	Department
	NEURT 309	Nerve Conduction and Electromyogram 1	NONE	3	Department
	NEURT 311	Clinical Practice 2	NEURT 304	3	Department
	BIOST 214	Biostatistics	NONE	2	College
Level 10	NEURT 401	Evoked Potentials 2	NEURT 307	3	Department
	NEURT 402	Nerve Conduction and Electromyogram 2	NEURT 309 NEURT 310	3	Department
	NEURT 404	Long Term Monitoring	NEURT 302 NEURT 308	2	Department
	NEURT 405	Clinical Practice 3	NEURT 311	3	Department

Program Study Plan

Level	Course Code	Course Title	Pre-Requisite Courses	Credit Hours	Type of requirements
Level 11	NEURT 403	Intraoperative Monitoring 1	NEURT 307 NEURT 302	3	Department
	NEURT 409	Therapeutic Techniques in Clinical Neurophysiology	NEURT 307 NEURT 302	3	Department
	RMETH 215	Research Methodology	BIOST 214	2	Department
	HIMT 410	Health Information Management and Technology	NONE	2	Department
Level 12	NEURT 407	Intraoperative Monitoring 2	NEURT 403	3	Department
	NEURT 408	Polysomnography and Sleep Disorders	NEURT 302	4	Department
	NEURT 411	Graduation Project	Passing level 11 RMETH 215	3	Department
	NEURT 412	Clinical Practice 4	NEURT 405	3	Department

Courses Description

First Year (Levels 1, 2 & 3)

- ### General English Language (ENG 101)
The purpose of this course is to build a comprehensive foundation of understanding about the process which will form the basis for connecting subsequent course work to the practice of the language in reading, writing and listening, both orally and in writing.

- ### Biology (BIOL 102)
The course is designed to introduce students to the major discipline of the biology. It begins with an Introduction to the properties of the living and nonliving things. The course covers aspects of cell structure, cell membrane, transport processes, in and out of the cell as well as cell division.

- ### Chemistry (CHEM 103)
This course covers the basic concepts, matter, units of the measurement, equations, atomic and molecular weights, chemical calculations, structure of the atom, periodic properties of the element, chemical bonding and molecular geometry, reactions in solutions and their calculations, gases, acids and bases.

- ### Physics (PHYS 104)
This course aims to enable the students to understand the basic physical principles and their relations to the daily life activities, especially to those related to the future career of the students and to develop scientific thinking in all aspects of the student's life.

- ### Computer Skills (COMO 111)
This course is designed to give nursing track students the fundamental concepts and operations necessary to use computers. Students will become familiar with the basic principles of computer system, including the hardware and software. It will also give students the confidence and skills to use key applications such as presentations (PowerPoint) and spreadsheets (Excel), as well as understanding social and ethical issues around the network, Internet, information, security, Cloud, and Health Information Systems (HIS).

Courses Description

First Year (Levels 1, 2 & 3)

- **Health Physical Education (PHEDU 162)**

This course shows the importance of sports and its impact on human health and how playing sports helps to maintain human health

- **Arabic Language Skills (ARAB 182)**

The course focuses on four main axes: discussing the problems of practicing the Arabic language, speaking and writing, writing and spelling rules, language skills through the study of texts, and applied skills in the Arabic language.

- **Creed and Ethics (ISLM 181)**

The course deals with defining the Islamic faith, naming the ranks of religion, and the pillars of faith: belief in God Almighty, His angels, His books, His messengers, the Last Day, and destiny, warning against the contradictions and shortcomings of faith, defining the rights of Ahl al-Bayt, the Companions, and the ruler, liberalizing the meaning of loyalty and disobedience, clarifying the concept of the family, its rulings, and building it. Clarifying the purposes of marriage, and the consequent family rights, and the differences between them, understanding the means of protection for the family, ways to end the marital relationship, Islam empowering women, and discussing some contemporary issues.

- **Learning and Searching Skills (LRSK 141)**

This course is designed to help new students in the college of Applied Medical Science develop basic skills needed to successfully complete their training. These skills consist, mainly, of effective reading, note taking, stress and time management, memory building, presentation skills, and preparing for exams. Students will be given the chance to apply these skills in their first biology course. This training will help the students perform better academically. The techniques learned in this first course will be applied to other courses as well.

- **English for Academic and Specific Purpose (ENGL 102)**

The purpose of this course is to build a comprehensive foundation of understanding medical terminology about the process which will form the basis for connecting subsequent course work to the practice of the language in reading, writing and listening, both orally and in writing.

Courses Description

First Year (Levels 1, 2 & 3)

- ### Communication Skills (LRSK 142)

This course is designed to help students acquire and develop important study and skills that are required to achieve greater success in their university life. It will cover core study ~~skills~~ topics that are interlinked and provide students with essential strategies and practical skills necessary for their success at university.

In addition, the course will cover the main communication skills that are essential for developing and improving students' communication effectiveness as well as their awareness of the importance of communication in their personal, academic and professional life. It will engage students in practical activities (presentations and roleplays) which provide them with opportunities to apply effective communication strategies, assess themselves and improve their skills.

Courses Description

Second Year (Level 4)

- **Anatomy (ANAT 201)**

This course enables the students to acquire basic knowledge of anatomy of the general systems of the body including cardiovascular, respiratory, lymphatic and the nervous systems. The respiratory system is covered in more details and the surface anatomy of the body is introduced in a basic form

- **Physiology (PHYL 202)**

This course is designed to provide the student with basic knowledge of the normal function of the human body and what takes place when disease or illness disrupts the normal processes. Basic aim is to highlight the relationship between systems and how they help to maintain the functioning of the whole body. Special emphasis is laid on homeostasis and the control systems that maintain it.

- **Electronics and Instrumentations for Electro Neurophysiology (NEURT 201)**

This course provides students with an overview of electronics and instrumentation as it applies to the field of clinical neurophysiology. It provides a study of fundamentals of electric circuit components (resistors, capacitors, and inductors) and the fundamentals of electronic components (Diodes, amplifiers, and filters) with their main functions. This course is concerned with recording, measuring, and monitoring bio-signals without deformations by discussing the principles of amplification, filtering, signal processing (aliasing) and ground

- **Islamic Ethics and Values (ISLM 282)**

The course deals with virtuous morals, values and morals in practice, and the legal rooting of them from the Qur'an and Sunnah and agreement with common sense, moderation and community identity, , and related skill and applied activities. It aims to achieve the moral and value building of the student's personality, and to determine the effects of values and morals on the behavior of the individual and society, and to find appropriate solutions to the problems of society in ethics and values, and to apply the knowledge balance of the student in practice.

Courses Description

Second Year (Level 5)

• History and Civilization of KSA (HIST 281)

This course shows historical and civilizational aspects of the Kingdom of Saudi Arabia and its cultural heritage, the efforts of its rulers in building a political and civilized state, their role in serving Arabian Islamic humanitarian causes, and achieving the 2030 vision in tourism and national heritage.

• Microbiology and Infection Control (MICRO 205)

This course will introduce the respiratory therapy students to basic microbiology concepts of the microbial world, with emphasis on structure, function, growth, sterilization, infection control, antimicrobial chemotherapy and common laboratory practices involved with the diagnosis of infectious disease of the respiratory tract. Students will learn about normal flora and common pathogens of the respiratory tract.

• Neuroanatomy (NEURT 208)

This course offers a basic understanding of the anatomical structure of the different parts of the nervous system as well as the anatomical basis of nervous system disorders. It also provides basic principles for the understanding of the relation between the anatomy of the nervous system and its disorders. The course will cover knowledge about the anatomy of the skull and vertebral column, development and abnormalities of the CNS in addition to the anatomy and blood supply of the different parts of CNS (spinal cord, brain stem, cortex, diencephalon, basal ganglia, ventricular system and cerebellum). It also describes the gross structure of the eye and ear as organs of special senses, as well as cranial nerves and muscles of the head and neck.

• Neurophysiology (NEURT 209)

This course offers a basic understanding of the function of the different parts of the nervous system as well as the physiological basis of nervous system disorders. The course covers knowledge about the physiology of the sensory and motor systems as well as sensory motor integration, the physiology of the cerebral cortex including higher functions as well as the physiology of the visual and auditory systems.

Courses Description

Second Year (Level 6)

• Introduction to Clinical Neurophysiology Profession (NEURT 202)

The course acquaints the students with the basics of practice of clinical neurophysiology profession in terms of handling equipment, adjusting vertical and horizontal resolution and artifact types. The course also introduces the students to the types and uses of different recording and stimulating electrodes, the basic principles and types of stimulation techniques, the near field and far field recording techniques and electric safety principles.

• Basic Clinical Assessment (NEURT 207)

This course prepares the students for the basics of clinical examination. Students will acquire knowledge and practice of assessing the different systems of the body. In addition, this course is designed to enable the students to become acquainted with the principles of basic neurological examination and assessment.

• Introduction to Pathology (PATH 210)

This course provides the students with an essential foundation in pathology necessary for the understanding of disease processes. The aim of the course is to provide a clear account of the basic pathological principles of disease as well as the pathological basis of nervous system disorders; essentially preparing the students for the practice of the Neuroscience Technology Profession.

• Pharmacology (PHARM 211)

This course provides students with a thorough understanding of the basic science of Pharmacology. In this course students will be introduced to pharmacology; its terminology and the systems set to control and promote safety and quality of the drug's use. They will acquire an understanding of the mechanisms of drug actions and their uses as well as the mechanism and factors underlying adverse drug reactions, interactions and toxicities. In addition, students will gain an understanding of the mechanisms and side effects of drugs acting on various organs and systems, such as, the cardiovascular system, the nervous system, the gastrointestinal system, the endocrine system. Students will also be introduced to the mechanisms of action and side effects of Diuretics, Antihypertensive drugs, Antidiabetics drugs anti-inflammatory drugs, antimicrobial drugs and anticancer drugs.

Courses Description

Third Year (Level 7)

• Central Nervous System Disorders (NEURT 301)

 The course introduces the students with knowledge about signs and symptoms of different neurological disorders. The students will learn the basic approach to diagnosing neurological diseases. This is achieved through a combination of lectures and case studies. The contributions of various Electro neurodiagnostic techniques, imaging, and laboratory testing in neurology will be considered in this course. The course will cover an overview of common neurological conditions including stroke, tumors, infections of the nervous system, and movement disorders

• Electroencephalogram 1 (NEURT 302)

This course offers a basic understanding of the fundamentals of EEG. The course covers knowledge about EEG system calibration, electrode placement, adjusting amplifiers filters and sensitivity for recording. It also acquaints the students with activation procedures, normal EEG in adults, benign variants, abnormal EEG in adults and clinical applications

• Bioethics (NEURT 213)

The course covers basic concepts in ethics, theories of morality, code of conduct and provides the tools for analyzing and solving ethical issues faced in the workplace. The codes of ethics for health care professionals by Saudi Commission for Health Specialties are covered. Additionally, the course underlines the principles of research ethics, standards of care and ethical guidelines by which a health care professional should abide, as well as defines malpractice, its causes, and ways to avoid it. Ethical issues related to patient autonomy, privacy confidentiality, communicating medical errors and bad news, organ donation, brain death, advance directives, DNR, and informed consent are also discussed. Implications of ethical and moral issues related to the practice of Neuroscience Technology are emphasized in this course

• Behavioral Sciences (PSYCO 206)

This course provides the students with an understanding of the psychological/behavioural and social components of health and illness. The focus is laid on understanding the complexity of relationships between healthcare provider, patients, their families, the community with the health issues.

Courses Description

Third Year (Level 7)

• Imaging and Sonography (NEURT 303)

This course will introduce the students to principles of sonography with main focus on terminology, physical principles and instrumentation .The course will also acquaint the students with the principles and indications of   transcranial Doppler. In addition, this course will cover basics of X-ray, CT, MRI, and Functional MRI and their application in diagnosing pathological conditions of the brain and spinal cord. .

Third Year (Level 8)

• Clinical Practice I (NEURT 304)

This course provides clinical experience for third year Neuroscience Technology students. Emphasis in this course is recording of EEG in adult population. Teaching will take place at the clinical site in the neurophysiology labs. Students will be divided into small groups and each group will be supervised by a Clinical Instructor from the Neuroscience Technology Department.

• Electroencephalogram II (NEURT 308)

This course is the second course for EEG techniques. The main focus of this course is EEG recording from neonatal and pediatric patients. The students will be introduced to both normal and abnormal developmental EEG patterns. Various epileptic and neurological pediatric syndromes as they are related to EEG studies will be discussed. The course will also cover normal variations in pediatric and neonatal EEG patterns and the technical requirements to consider while recording from pediatric   population.   This course will consist of both lectures and laboratory sessions.

• Neuromuscular Disorders (NEURT 310)

The course introduces the students with knowledge about signs and symptoms and presentations of different neuromuscular disorders. The students will learn the basic approach to diagnosing peripheral nervous system diseases. This is achieved through a combination of lectures and case studies. The contributions of various electroneurodiagnostic techniques, imaging, and laboratory testing in diagnosing such disorders will be considered in this course. The course will cover an overview of common neuromuscular conditions including peripheral neuropathies, disorders of the neuromuscular junction, and autonomic disorders.

Courses Description

Third Year (Level 8)

• Entrepreneurship (BUS 381)

The course deals with the concept of entrepreneurial thought and the importance of entrepreneurship on the personal and economic levels. It reviews how to transform ideas into applied projects in accordance with the foundations and plans for establishing sound commercial projects and achieving the Kingdom's 2030 vision in the field of creating job opportunities by supporting entrepreneurship. The course aims to introduce the principles and foundations of entrepreneurship and its practical applications, and to find pioneering solutions to existing social problems, in addition to acquiring the basic skills to run any entrepreneurial project successfully.

Third Year (Level 9)

• Evoked Potentials 1 (NEURT 307)

The course will introduce students to the basics of somatosensory evoked potential testing including stimulation and recording parameters, near field and far field recording. It will acquaint the students with the clinical indications for somatosensory evoked potentials recording, the proper identification of different peaks and recognition of abnormalities. This course will also introduce the students to transcranial magnetic evoked potentials technique and indications, and clinical applications. The course includes a lab through which the students will practice how to setup a somatosensory protocol and properly adjust filters, amplifiers recording and stimulation parameters as a preparatory step for clinical application

• Nerve Conduction and Electromyogram 1 (NEURT 309)

This course will introduce students to nerve conduction and EMG studies. It will acquaint the students with the principle's techniques, and interpretation of motor and sensory nerve conduction studies. It will provide students with knowledge about the theoretical basis of nerve conduction and EMG, and the assessment of motor unit potentials. It will acquaint the students with nerve conduction abnormalities including axonopathy, demyelination and the concept of conduction block. The course will include a lab

Courses Description

Third Year (Level 9)

- Clinical Practice 2 (NEURT 311)

This course provides clinical experience for third year Neuroscience Technology students. Emphasis in this course is somatosensory evoked potential recording as well as recording electroencephalogram from the pediatric age group. Teaching will take place at the clinical site in the neurophysiology labs. Students will be divided into small groups and each group will be supervised by a Clinical Instructor from the Neuroscience Technology Department

- Biostatistics (BIOST 214)

This course introduces basic statistical concepts that include both descriptive and inferential statistics. The course is intended to qualify students to professionally conduct and evaluate health related and biomedical research starting from learning sampling techniques, to collecting, managing, presenting data, analyzing, and interpreting results. Specific topics include tools for describing central tendency and variability, probability and probability distributions, hypothesis testing, methods for performing inference on population means and proportions, correlation, and regression.

Fourth Year (Level 10)

- Evoked Potentials 2 (NEURT 401)

The course will introduce students to the basics of auditory evoked potentials testing and visual evoked potentials testing. It will provide knowledge about the principles of auditory evoked potentials testing including stimulation and recording parameters, measurement of auditory evoked potential wave forms and interpretation of waveforms. The course will also acquaint the students with visual evoked potentials principles, recording, stimulation measurement and interpretation of waveforms.

Courses Description

Fourth Year (Level 10)

- ### Nerve Conduction and Electromyogram 2 (NEURT 402)

The course provides the students with a comprehensive overview of nerve conduction and EMG through a case study approach. The common neurological disorders are presented in the form of clinical scenarios. In each case the history and clinical presentation will be discussed. The relevant anatomy and physiology will be revised and the electrophysiological findings will be analyzed to reach a definitive diagnosis. The cases are organized in three large categories, 1. the focal disorders of the upper limb, 2. The focal disorders of the lower limb 3. Generalized disorders. This course is a preparation for performing nerve conduction and EMG in clinical practice. The course will include a lab.

- ### Long Term Monitoring (NEURT 404)

This course offers a basic understanding of indications, methodology and interpretation of ambulatory EEG. The course covers knowledge about Video EEG monitoring equipment, techniques and application. It also acquaints the techniques of continuous EEG monitoring in intensive care, its indications and methods of interpretation. It also provides the students with basic knowledge of invasive EEG monitoring methodology and indications.

- ### Clinical Practice 3 (NEURT 405)

This course provides clinical experience for third year Neuroscience Technology students. Emphasis in this course is nerve conduction studies and electromyogram recording as well as recording of auditory and visual evoked potentials. Teaching will take place at the clinical site in the neurophysiology labs. Students will be divided into small groups and each group will be supervised by a Clinical Instructor from the Neuroscience Technology Department.

Courses Description

Fourth Year (Level 11)

• Intraoperative Monitoring 1 (NEURT 403)

The course provides knowledge about the various neurophysiological techniques used in intraoperative neurophysiological monitoring. It acquaints the students with the use of free run and triggered EMG for monitoring cranial and peripheral nerves. It introduces the students to the use of somatosensory evoked potentials and motor evoked potentials in monitoring the long tracts during surgery. It also provides knowledge about the intraoperative applications of EEG and brainstem auditory evoked potentials. The students will understand the effects of different anesthetics, and physiological on neurophysiological signals and will be informed about the different technical, and safety issues related to the operating room. The course will include a lab.

• Therapeutic Techniques in Clinical Neurophysiology (NEURT 409)

This course offers a basic understanding of the therapeutic techniques used in clinical neurophysiology and its clinical and psychiatric indications. It also introduces the students to the basics, methodology application and interpretation of quantitative EEG

• Research Methodology (RMETH 215)

This course will introduce the students to the research process steps, such as, selecting the topic, constructing the research question, literature review and the use of different statistical approaches for analyzing data. Moreover, different research methods such as quantitative and qualitative will be explained

• Health Information Management and Technology (HIMT 410)

This course will explore the concepts and applications of major information systems methodologies and approaches in the delivery of modern healthcare systems and their application in neuroscience Technology. The course provides an overview of various health information systems, with emphasis on case studies of systems utilized in areas such as neuroscience, clinical decision-support, disease surveillance, imaging, and patient safety. Legal and ethical issues related to security, confidentiality, and the uses of informed consent are also addressed.

Courses Description

Fourth Year (Level 12)

• Intraoperative Monitoring 2 (NEURT 407)

The course provides the students with knowledge about the various surgical procedures requiring intraoperative monitoring, . It acquaints the students with multimodality monitoring techniques used during different surgeries. It will provide the students with knowledge about the analysis and interpretation of multimodality electrophysiological techniques during surgery and introduces them to different methods of prediction of postoperative outcome. The course acquaints the students with appropriate protocol setup and preparation , electrode application and patient positioning for monitoring of different procedures including skull base, spine , brain and peripheral nerve surgeries. The course will include a lab.

• Polysomnography and Sleep Disorders (NEURT 408)

This course is designed to provide the students with an overview of normal sleep and classification and types of sleep disorders. It will also acquaint the students with the techniques and modalities used for polysomnography recording; as well as the information required for understanding and interpretation of recorded data. The course will provide the students with the basic knowledge concerning the polysomnographic findings of different sleep disorders, as well as events recorded during polysomnography. Principles of polysomnography scoring will be also introduced in this course. The course will include a lab.

Courses Description

Fourth Year (Level 12)

• Graduation Project (NEURT 411)

This course provides students with the opportunity to apply research skills and carry out a one semester-research project related to neuroscience field under the supervision of a faculty member (research supervisor). Students will undertake the research process required to conduct a literature review, perform data collection, statistical analysis, writing up of the research paper, and preparing a research poster. Students will present their research in the Poster Presentation Day.

• Clinical Practice 4 (NEURT 412)

This course provides intraoperative clinical experience for fourth year Neuroscience Technology students. Emphasis in this course will be on attending live surgeries to be acquainted with the intraoperative environment, sterile zone and the proper circulation in the OR. The course will focus on observing recording and stimulating electrode insertion and connection according to the setup. It will also acquaint the students with the methods to record reliable interpretable waveforms, mark waveforms and calculate, latencies, amplitudes of evoked potentials. The students will also practice methods to identify reduce noise in the OR, and safely handle electrodes. In addition, the students will be offered the possibility to revise and edit test setups, observe the important surgical setups and recognize the risky parts of surgery. The students will have the chance to learn the basics of communication between the surgeon, neurophysiologist and anesthesiologist and write a case report. Students will be divided into small groups to attend a procedure and each group will be supervised by a Clinical Instructor from the Neuroscience Technology Department.

Internship Program

After a successful completion of all courses and academic requirements, the student should have 12 months (52 weeks) of internship in clinics and hospital. Training includes applied clinical practice in all disciplines of neuroscience technology that studied during the four years of college. Covering the following areas:

No.	Rotation	Duration
1	Electroencephalography Clinic (EEG) Epilepsy Monitoring Unit (EMU)	21 Weeks
2	Nerve Conduction Study (NCS) Evoked Potentials (Visual, Auditory, Somatosensory)	21 Weeks
3	Intraoperative Neuromonitoring (IONM)	10 Weeks
Total Weeks		52

Teaching and Assessment Strategies

Program Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent harmony to ensure achievement of PLO.

Teaching Strategies

- Interactive lectures
- Skill laboratory
- Simulations
- Case studies
- Large and small group discussions
- Assignment
- Bed side clinical
- Teaching for field experience
- E-learning activities

Assessment Methods

Assessment methods used in the program include:

- Written exams (multiple choice question, R-type, and short essay)
- Practical evaluations of technical skills (OSCE, OSPE),
- Clinical assessments of students' performance in real-world settings (using checklist, rubric),
- Peer evaluation and checklist rubric for poster and TBL.

Academic Advisory

All students have an assigned faculty advisor upon entry to the program. The advisor is available in person at office hours, via email, or by telephone. NST faculty advisors individually assist NST students with information about academic and program requirements, academic planning and scheduling, course registration, and any issues that may arise during the academic year.

Academic Advisors Contact Information

Name	Position	E-mail	Extension
Dr. Monika Bansal	Professor	mbbanasl@iau.edu.sa	38715
Dr. Hadeer Ibrahim Mohamed Ibrahim	Assistant professor	hiibrahim@iau.edu.sa	38781
Dr. Nihad Abdul Amanullah	Assistant professor	naamamullah@iau.edu.sa	38589
Dr. Amina Sabry Abdalghaffar Emam	Lecturer	asemam@iau.edu.sa	38777

For more information regarding student services, rights and duties please click on the link below:

https://www.iau.edu.sa/sites/default/files/resources/1_6.pdf

Program Achievements

The Neuroscience Technology Program is a pioneer and the first of its kind to offer a Bachelor's degree at the local, regional levels.

- It the first program in the Middle East.
- The program has received official classification and registration from the Saudi Commission for Health Specialties as a recognized Neuroscience Technologist program.
- Fifteen students from the program participated in presenting scientific posters at the Saudi Epilepsy Society Conference.
- Clinical learning videos have been established to guide students in procedures like applying electrodes and performing an Electroencephalogram (EEG) and nerve conduction studies.
- The first batch of students completed their internship at the National Guard Hospital in Riyadh and received awards from the neurology department.
- Five students are contributing to a funded project in collaboration with Cambridge University- RCHSCI Society in England under the title of "Precision and interference assessment of 3 commonly used Glucometers in Saudi Arabia."
- Twenty-five students presented their scientific posters in the first Saudi multiple sclerosis conference.

Extracurricular Activities

CAMSJ's extracurricular activities and students' committees are planned and executed by the Student Activities Unit under the umbrella of the Vice Deanship of Academic Affairs. The unit is concerned with strengthening the bonds and boosting the relationship between students of CAMSJ and deepening the spirit of loyalty to their college, and the University. It strives hard to fill their leisure times with activities aimed at enhancing their cultural, psychological, and mental abilities as well as provision of all means of comfort through different student services aims at creating a motivated educational environment.

Activities may include the following:

- Student counseling.

- Cultural events.

- Sports activities.

- Leisure trips.

Program extracurricular activities

- Neurosciences Technology Day
- Electronics Projects Day

Planned community services

- World Multiple Sclerosis Day
- Epilepsy Awareness Day
- World Brain Day
- World Sleep Day

For more information on student rights and duties, please visit IAU's website or contact the Student Activities Unit at CAMSJ.SA@iau.edu.sa.

Graduation Requirements

To obtain a Bachelor of Technology in Neuroscience from Imam Abdulrahman bin Faisal University, the student must complete the following graduation requirement:

A. Completion of total credit units which are 134 credit hours according to the University, the college and the program

B. Following successful completion of the four years in the undergraduate Neuroscience Technology program, the student must spend 52 weeks of hospital-based internship period.

Employment Opportunities

Graduated neurosciences technologists have various career opportunities. Different fields the technologists can join depending on their interests. Including jobs in:

- Health care
- Ministry of Health
- Private sectors
- Research centers
- Academia

The department has the potential to invest in human resources by sponsoring scholarships to qualify its staff for their future roles as University professors.

Alumni

CAMSJ is an all-female college. As neuroscience technology program is newly established, the figure reveals the total number of students graduated from the program.

Number of Neuroscience Graduated on Time
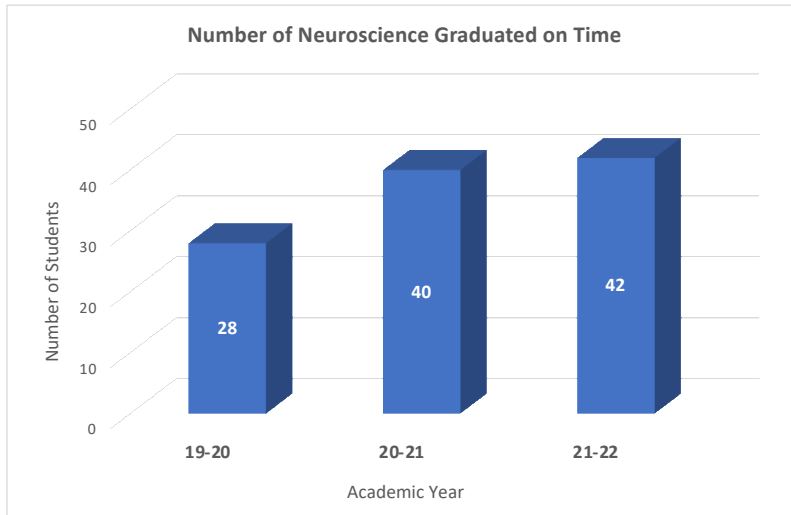
Acknowledging the significance of NST alumni, the program actively engages them in the program's enhancement, valuing their input and expertise. Their valuable contributions help shape the program's learning outcomes, ensuring their relevance and alignment with current needs. Moreover, alumni play an active role in social initiatives, utilizing their expertise to raise public awareness about important issues within their respective fields through community service.

To promote effective communication and optimize program productivity, the NST program actively engage alumni through various social media platforms. This approach facilitates meaningful interactions and enables positive outcomes for the institute, students, employers, and society as a whole. To access to the CAMSJ pages, you can simply click on the below icons.

@IAU_CAMSJ   linkedin.com/compa   IAU_KSA
                    ny/college-of-
                    applied-medical-
                    sciences-in-jubail/