



جامعة الإمام عبد الرحمن بن فيصل  
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY

كلية العلوم الطبية التطبيقية بالجبيل

# Neuroscience Technology Laboratory Manual

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## **Introduction**

### *Purpose*

Neuroscience Program was established in 2017 in the College of Applied Medical Sciences in Jubail under the umbrella of Imam Abdulrahman bin Faisal University. The journey of the Neuroscience (NS) Lab began by designing and equipping the laboratory with the essential tools and machines that serves all NS courses, including Electroencephalogram, Nerve Conduction Study, Evoked Potentials and Intraoperative Monitoring.

Now the laboratory features facilities and specialized zones that are furnished with cutting-edge equipment and tools required to accomplish the objectives, aspirations, and targets of the NS department.

### *Objectives:*

- Defining the range of responsibilities and duties associated with the administration and operation of neuroscience technology laboratories.
- Provide a safe and convenient practical workspace to achieve the best teaching and learning experiences.
- Ensuring the adherence to safe work practices by all members of neuroscience technology laboratories.
- Establishing general guidelines for maintaining the integrity and functionality of neuroscience technology laboratories' equipment.
- Defining the approaches utilized to evaluate the performance of practical sessions for both instructors and the students.

## **Description of Job Responsibilities**

### *Chairperson of Specialized Laboratories Committee*

The chairperson of specialized laboratories provides oversight and management to all specialized laboratories in the college including neuroscience labs. The following list of responsibilities are assigned to the chairperson of specialized laboratories.

- Monitor safe operation and conduction of procedures and secure a safe laboratories environment for students and staff.
- Provide continuous supervision to ensure that all safety measures and precautions are being implemented by faculty members, lab instructors and students while utilizing NS laboratory facilities.
- Revise operation and usage instruction manuals for each device regularly and update them as necessary.
- Organize machine in-service training and demonstration sessions for the faculty members and lab instructors for newly purchased devices or as needed.
- Follow-up with the purchasing department at the university for any requests and periodic preventive maintenance (PPM) in coordination with lab coordinator.
- Conduct a report twice a year by the lab coordinator that includes updated laboratories' equipment, consumable items, and inventory.
- Follow-up with the lab coordinator to ensure the availability of the required equipment for the next academic semester.
- Ensure that all hazardous and sharp wastes are collected and disposed safely via specialized company.
- Take-part in the development plans for respiratory laboratories facilities as needed.
- Report any abnormal observations or non-adherent acts to the department chairperson.

### *Neuroscience Technology Lab Coordinators*

The Neuroscience Technology Laboratories coordinators, in the hierarchy, reports directly to the chairperson of the Neuroscience department. The following tasks are assigned to them:

- Direct supervision of department's lab in terms of readiness, maintenance, safety, and lab instructor's performance.
- Revise lab policies and provide comments to the NS chairperson.
- Participate in developing lab manual in coordination with course instructors.
- Helping in conducting lab sessions in coordination with course instructors
- Report any issues related to equipment and lab facilities to the lab chairperson.
- Manage the department's lab inventory and preform annual inventory check.
- Conduct orientation for new lab instructors and provide help as needed.
- Follow up the implementation of general safety rules and regulations.
- Prepare list of required equipment list and lab consumables in coordination with lab instructors according to the approved policy.
- Participate in providing in-services, workshops and training for department lab facilitators and any interested faculty.
- Follow the policy to secure all department's lab exits and medical gas room.
- Participate in organizing extracurricular department's activities.
- Maintain the quality of department's lab by evaluating lab and lab instructors and analyze the results (lab instructor evaluation)
- Attend the departmental meetings and other committees related to Neuroscience lab.

## *Neuroscience Technology Lab Coordinators*

The Neuroscience Technology Instructors, in the hierarchy, reports directly to the coordinator of Neuroscience Technology laboratory. The following tasks are assigned to them:

- Ensure the efficiency of the equipment used during the lab sessions.
- Assisting in the preparation of the lab annual lists of equipment and consumables.
- Assisting in the preparation of lab manuals in coordination and cooperation with relevant staff.
- Communicate with the lab coordinator to discuss the availability of equipment and consumables prior to the lab sessions.
- Perform weekly Periodic Preventive Maintenance (PPM) of the machines for instance the calibration performance and ensure safe connections (*Appendix A*).
- Classify the equipment and consumables based on inventory list at the end of academic semester that is provided by the lab director.
- Conduct lab sessions under the supervision of course instructor and follow-up of students during practice.
- Managing equipment and consumables, and report shortcomings to the laboratory coordinator.
- Assist in conducting research projects for faculty members and students when necessary.
- Follow up the proper implementation of all health and safety procedures in the laboratory.
- Coordination of work in the laboratory to ensure the effective use of all lab facilities and equipment.
- Annually review all lab policies and make suggestions to the laboratory coordinator.
- Attend department's meetings as needed.
- Participation in the organization and implementation of the curricular and extracurricular activities.

## **Performance and Attendance Policy**

### *Students Performance and Attendance*

Attendance policy is implemented to track the student attendance to the laboratory teaching sessions as part of the total course attendance.

- The lab instructor is responsible to obtain the class roster generated from student information system (SIS) from the course coordinator.
- Students' attendance is recorded prior to the beginning of the lab session and should be reported to the course coordinator daily.
- The course coordinator is responsible to enter the attendance report electronically in the (SIS) on a daily basis.
- The course coordinator is responsible for sending warning emails for students who have reached 15% of absenteeism.
- Students who have reached 25% of total course absenteeism must be prohibited from entering the laboratory sessions and reported to the vice dean of academic affairs.
- Students progress and performance is evaluated by either continuous assessment check lists or objective structured practical examination (OSPE) rubrics following the course specification assessment tools.

### *Lab Instructor and Demonstrator Evaluation*

Lab staff performance is evaluated as follows:

- Lab instructors and demonstrators' performance is evaluated annually by the department chairperson following IAU policy.
- The semestral performance evaluation of lab sessions and faculty members is done electronically by students via Estibana system on IAU website page.

## **NS Laboratory Safety and Precautions**

### *Lab Safety Precautions policy*

- White laboratory coat should be worn with closed buttons at all the times in the laboratory.
- Long hair must be tied such that it will not interfere with the equipment or reagents.
- Sandals and open style shoes do not afford proper protection and are not accepted.
- Students shouldn't wear contact lenses in the laboratory (absorb certain solvents and maybe a hazard from splashes and spills), or wear safety glasses when working with caustic or infective materials.
- Eating, drinking, storing food or beverages in the laboratory or in its refrigerator is prohibited.
- Personal protective equipment (gloves, mask, goggle, and yellow gown) should be worn inside the lab. Mask with plastic shield should be worn when handling chemicals to reduce splashing). When leaving the laboratory, it should be discarded in appropriate containers.
- Cosmetics, artificial nails/ wraps or acrylic overlays are prohibited in the laboratory.
- Practical jokes are always against rules " The laboratory is a quite area".
- All laboratory staff must ensure that the conditions of their work do not create any hazard for those working nearby.
- All students should be instructed on the location and operation of all safety equipment and facilities, such as fire blankets, fire extinguishers, first aid box, and eye wash which must be readily accessible to all staff.
- Cuts, scratches, and other lesions on the hand and exposed parts of the body should be covered with adhesive plasters.

### *Hazardous Waste Disposal*

All medical wastes are carefully handled in yellow bin bags and collected every morning to be placed in the integrated lab. Medical Hygiene Services Co. Ltd picks up the medical waste every week for professional disposal. Additionally, when sharp wastes reached the maximum line in the containers, the company collects the sharp containers and replace it with empty and sanitized ones.



## *Fire Safety*

- NS Labs follows CAMS-J evacuation plan once code red is announced.
- All staff and students are regularly oriented to fire containment steps and the evacuation assembly points in the campus.
- In case of fire incident in the lab, the present individual at the site must follow the fire containment steps which consists of the RACE and PASS procedures as follows.
  - **R.A.C.E.**
    - R** Rescue/Remove anyone from immediate danger to a safe area.
    - A** Alarm, Assess the situation then Call Code Red, and pull the nearest fire alarm.
    - C** Confine the fire by closing all doors/windows in the fire area, Don't Lock the door.
    - E** Extinguish the fire if safe to do so or evacuate the area
  - **P. A. S. S.**
    - P** Pull the pin.
    - A** Aim nozzle at base of fire.
    - S** Squeeze handle.
    - S** Sweep nozzle side to side.

## **NS Laboratories Using Policies**

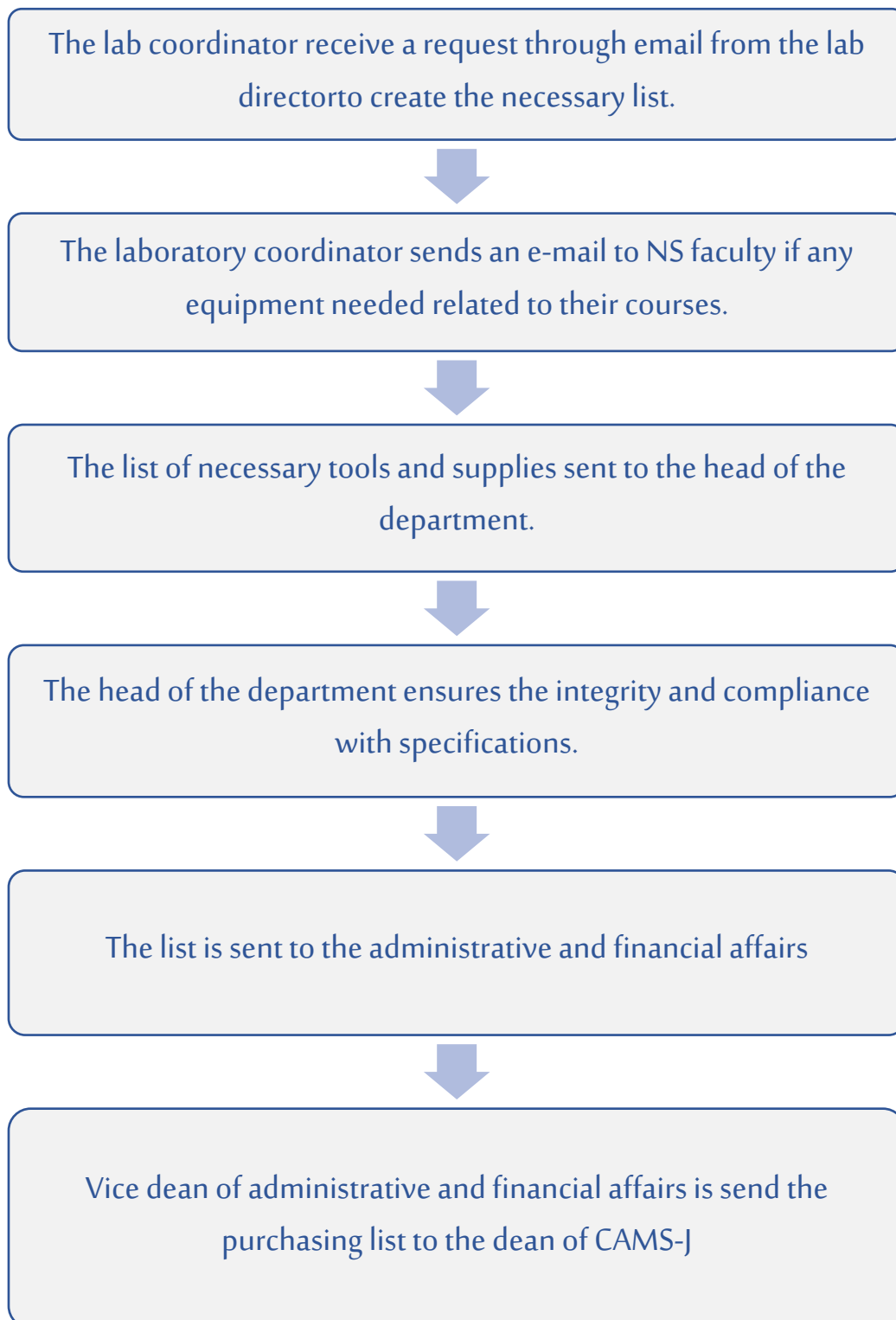
### *Lab Using Instructions*

- The laboratory must be kept clean, neat, and free of materials that are not pertinent to the work.
- Work surfaces are decontaminated at least once a day and after each spill of viable materials.
- All laboratory material must be assumed to be infectious for a pathogen.
- All laboratory staff must change gloves and wash hands when finished processing simulated patient procedure.
- Laboratory staff should wash their hands after completing activities and handling infectious materials and should remove protective and clothing before leaving the area and dispose in an appropriate container.
- Laboratory bench work must be clean properly using special disinfectant before and after any procedure to prevent contamination.
- Laboratory work surfaces should be decontaminated with an appropriate germicide after spill of any biohazard materials.
- Wear protective clothing (PPE); disposable yellow gown, gloves, mask, and eye protection.
- All laboratory equipment must be handles correctly and returned back to its place after use.

### *Borrowing Policy*

CAMS-J faculty members, staff and students must use borrowing materials form and submit it to the lab coordinator in order to borrow supplies from one lab to another inside the institution or from outside the campus. Borrowing equipment can be for community service or educational purposes. This form helps the lab coordinator to keep track of all the borrowed equipment. Moreover, the items will be inspected to determine their condition once returned (*Appendix B*).

## Purchasing Request Procedure



## Maintenance and Quality Control Policies

### *Calibration and Safety*

Prior to lab sessions, the lab instructor is responsible for warning-up the devices to be used and performing for following machines:

- Electroencephalogram (*Appendix C*)
- Nerve Conduction Study and EMG (*Appendix D*)
- Intraoperative Monitoring (*Appendix E*)


### *Maintenance Companies Contact Information*

The contact information for maintenance personnel are listed in the table below.

<b>NO.</b>	<b>Name of Device</b>	<b>Supplier Companies</b>	<b>Contact</b>
<b>1</b>	Natus Electroencephalogram	Medi Serve	0503854936
<b>2</b>	Natus Nerve Conduction Study and Electromyogram		
<b>3</b>	Natus Intraoperative Monitoring	Alam Altaawin	0540711358
<b>4</b>	Transcranial Magnetic Stimulation		

## Appendix A

### Periodic Preventive Maintenance Checklist



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Weekly maintenance checklist for EMG machine

Month of: March

Items Date	Monitor and visual stimulator, headphones, and eye goggles			Main power, isolation box, printer, mouse, keyboard			Amplifier		Electrical stimulator		Connections (cup and ring electrodes, jumpers)			Checked By
	Connection	Dust free	Power on the system properly	Overall performance	Machine grounding	Wires and connections place	Power functioning	Channels (port hole) functioning	Free of dust and gel	Hooked on hanger	Hooked on hangers	Not tangled	Clean and dry	
06/03/22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	BY
13/03/22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	BY
20/03/22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	BY
27/3/22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	BY


  

Date	Remarks	Action taken	Corrective action	Checked by
05/03/22	Preventive maintenance done by the company biomedical	Machine working well - only PPM Done	-	BY

Note: satisfactory ✓ unsatisfactory ✗

## Appendix B

### Borrowing Materials Form



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**استعارة مواد – Borrowing Materials**

Applicant data أولاً: بيانات مقدمة المطلب					
					Name الاسم
Date التاريخ	التوقيع Signature			رقم الجوال Mobile Number	هـ ١٤ / /
Details of Permit ثانياً: تفاصيل التصريح					
debate مناقشة <input type="checkbox"/> show عرض <input type="checkbox"/> ceremony حفل <input type="checkbox"/> exhibition معرض <input type="checkbox"/> lecture محاضرة <input type="checkbox"/> maintenance صيانة <input type="checkbox"/> others أخرى <input type="checkbox"/> supply توريد <input type="checkbox"/>		الأسباب Reasons	Enter إدخال <input type="checkbox"/> Taking out إخراج <input type="checkbox"/>	نوع التصريح Type of permit	
Date التاريخ	الوقت Time			في حال إخراج الصنف التاريخ الموعد لإرجاعه Expected date of returning the item	هـ ١٤ / /
هل يوجد جهات خارجية تقوم بنقل الأصناف أو المستلزمات؟ Is there any external carrier to transfer the items	Yes نعم <input type="checkbox"/> No لا <input type="checkbox"/>			اسم الجهة الناقلة: (خارج الكلية) Name of Carrier	

ملاحظات Notes	حالة الصنف				الكمية Quantity	الوحدة Unit	رقم الصنف Item Code	اسم الصنف ووصفه Item Name and description	#
	الإعادة Returning		الاستعارة Borrowing						
	متضرر Damaged	سليم Good	مستعمل Used	جديد New					
									١
									٢
									٣

من		إلى	
اسم المُتَّيِّم Lender	اسم المُسْتَعَارِ Borrower		
التوقيع Signature	التوقيع Signature		
التاريخ Date	التاريخ Date		
		اسم المُسْتَعَارِ Borrower	
		التوقيع Signature	
		التاريخ Date	

تم معاينة الأصناف المذكورة أعلاه والتأكد من سلامتها وتحديد الصنف لكل منها بحضور كل من:

Date التاريخ	Signature التوقيع	Name الاسم	الإعادة Returning	Date التاريخ	Signature التوقيع	Name الاسم	الاستعارة Borrowing
			موظفة أمن Security				موظفة أمن Security

\*صلاحية استخدام النموذج لموظفي الكلية وأعضاء هيئة التدريس فقط \*Only Staff and Faculty are authorized to use this form


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الرقم: \_\_\_\_\_  
التاريخ: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
الصفحة: \_\_\_\_\_

## Appendix C

### Weekly Preventive Maintenance for EEG Machine



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**Weekly maintenance checklist for EEG machine**

Month of: \_\_\_\_\_

Items Date	Monitor (date acquisition computer) program USB flash			Main power, isolation box, printer, mouse, keyboard			Amplifier		Connections (cup electrodes)			Checked By
	Connection	Dust free	Power on the system properly	Overall performance	Machine grounding	Wires and connections	Power functioning	Channels (porthole) functioning	Hooked on hangers	Not tangled	Clean and dry	
What to be checked												
Checked date												


  

Date	Remarks	Action taken	Corrective action	Checked by

Note: satisfactory √ unsatisfactory ×

## Appendix D

### Weekly Preventive Maintenance for EMG Machine



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**Weekly maintenance checklist for EMG machine**

Month of: \_\_\_\_\_

Items Date	Monitor and visual stimulator, headphones, and eye goggles			Main power, isolation box, printer, mouse, keyboard			Amplifier		Electrical stimulator		Connections (cup and ring electrodes, jumpers)		Checked By
	Connection	Dust free	Power on the system properly	Overall performance	Machine grounding	Wires and connections place	Power functioning	Channels(porthole) functioning	Free of dust and gel	Hooked on hanger	Hooked on hangers	Not tangled	
What to be checked													
Checked date													

Date	Remarks	Action taken	Corrective action	Checked by

Note: satisfactory √ unsatisfactory ×



## Appendix E

### Weekly Preventive Maintenance for IOM Machine



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#### Weekly preventive maintenance checklist for IOM machine

Month of \_\_\_\_\_ 2023

Items Date	Ground and Electricity		Connections				Main power, isolation box, acquisition box and recording box		Checked By
	Overall Performance	Evaluation of Ground Connection	Cable inspection	Wires and connections place	Unplug extra devices e.g., printer (source of interference)	Minimal Connections to the headbox	Overall Performance		
What to be checked									
Checked date									

Date	Remarks	Action taken	Corrective action	Checked by

Note: satisfactory √ unsatisfactory ×

