وصف البرنامج الأكاديمي

اسم الجامعة: جامعة نينوى

الكلية/ المعهد: كلية.هندسة الالكترونيات.

القسم العلمي: قسم هندسة الطب الحياتي

اسم البرنامج الأكاديمي او المهني: بكالوريوس هندسة طب حياتي

اسم الشهادة النهائية: بكالوريوس علوم في هندسة الطب الحياتي

النظام الدراسي: بولونيا

تاريخ اعداد الوصف: **7/3/2024**

تاريخ ملء الملف: **7/4/2024**

التوقيع:

اسم رئيس القسم:أ.م.د.يونس محمود عبوش

التاريخ:

التوقيع:

اسم المعاون العلمي: أ.م.د.بلال علاءالدين جبر

التاريخ:

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي:

التاريخ

التوقيع

مصادقة السيد العميد

1. رؤية البرنامج
نظـرا للتطـور الحاصـل فـي مجـال الطـب الحيـاتي عالميـا ومحليـا , وتـداخل الاختصـاص الهندسـي والطبـي فـي كثيـر مـن التطبيقـات الحديثـة, اصـبح مـن الـلازم مواكبـة هـذا التطـور مـن خـلال اسـتحداث قسـم الطـب الحيـاتي فـي كليـة هندسـة الالكترونيـات فـي جامعـة نينـوى مـن اجـل رفـد المنشـآت الطبيـة والتعليميـة بهـذا التخصـص النـادر كمـا ويتطلـع القسـم الـى التعـاون مـع الاقسـام العلميـة المنـاظرة المحليـة والدوليـة وبصـورة خاصـة مـع الاختصاصـات الطبيـة المكملـة فـي وزارة التعلـيم العـالي ووزارة الصـحة لاسـيما وان القسـم فـي طـور التكـوين وكـذلك الانفتـاح علـى المجتمـع وتسـخيرامكانية القسـم المادية والبشرية لخدمة المجتمع

2. رسالة البرنامج
يسـعى قسـم هندسـة الطـب الحيـاتي فـي كليـة هندسـة الالكترونيـات الـى مجـاراة الحاجـة الحقيقيـة المتغيـرة للمجتمـع الهندسـي الطبـي فـي اقسـامه المختلفـة مـن خـلال متابعـة وتحـديث المنـاهج وتطويرهـا بمـا يتناسـب مـع المتغيـرات المختلفـة ابتـداء مـن الحاجـة المتغيـرة وصـولا الـى القفـزات التكنولوجية المختلفة في مجالات العلوم الطبية.

3. اهداف البرنامج
1-بنـاء مهنـدس يتميـز بمعرفتـه العلميـة والعمليـة للتطبيقـات الهندسـية فـي المجـالات الصـحية والطبيـة كافـة، وان تكـون لـه المعرفـة المتميـزة بحيـث تمنحـه القـدرة علـى تصـميم وتطـوير وصـيانة وتشـغيل الاجهـزة الطبيـة الحديثـة بمـا يسـاهم فـي رفـد الحركـة العلميـة والطبيـة والمساهمة في اجراء البحوث ذات العلاقة بالجانب الطبي والحياتي. 2- خـريج مهنـدس قـادر علـى تطبيـق المفـاهيم التشخيصـية والعلاجيـة المتقدمـة المرتبطـة بالتقنيات الهندسية الحديثة في المجال الطبي. 3-اعـداد ملاكـات هندسـية ذات خلفيـة طبيـة جيـدة تمكنـه مـن التواصـل مـع جميـع اطـراف المجتمع الطبي لتغطية متطلبات وزارة الصحة العراقية لهذا الاختصاص. 4- المسـاهمة فـي البنـاء العلمـي والمعرفـي للطالـب فـي تخصـص هندسـة الطـب الحيـاتي وتشـجيعه علـى الاهتمـام بالبحـث العلمـي لمواكبـة التطـور الحاصـل فـي مجـال التخصـص. وكـذلك تحـديث معلوماتـه بـين الحـين والاخـر مـن خـلال حـث الطالـب علـى الـتعلم الـذاتي واسـتخدام البـرامج التـي تبتكـر بـين فتـرة واخرى.

4. الاعتماد البرامجي
لا يوجد

5. المؤثرات الخارجية الأخرى
لا يوجد

6. هيكلية البرنامج				
هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *
متطلبات المؤسسة	4	10	3.33%	1-مقرر أساسي 2- مقرر أساسي 3-مقرر أساسي 4-مقرر اساسي
متطلبات الكلية	2	13	4.33%	1-مقرر أساسي 2-مقرر قسم
متطلبات القسم	54	277	92.3%	
التدريب الصيفي	لا يوجد حاليا			كون القسم لدية مرحلة أولى فقط
أخرى				

* ممكن ان تتضمن الملاحظات فيما إذا كان المقرر أساسي او اختياري.

7. وصف البرنامج لقسم هندسة الطب الحياتي المرحلة الاولى				
السنة / المستوى	رمز المقرر أو المساق	اسم المقرر أو المساق	الساعات المعتمدة	
			نظري	عملي
الاول/الفصل الدراسي 1	NVEE215	DC Circuits Analysis	4	2

الاول/الفصل الدراسي 1	NVEE206	Mathematics I	4	–
الاول/الفصل الدراسي 1	NVEE217	Digital Techniques	2	2
الاول/الفصل الدراسي 1	NVEE201	Engineering drawing	2	2
الاول/الفصل الدراسي 1	NVEEBM105	Chemistry	3	–
الاول/الفصل الدراسي 1	NVEEBM11	English	2	1
الأول/الفصل الدراسي 2	NVEE216	AC Circuit Analysis	4	2
الأول/الفصل الدراسي 2	NVEE207	Mathematics II	4	–
الأول/الفصل الدراسي 2	NVEEBM109	Computer programming	3	2
الأول/الفصل الدراسي 2	NVEEBM111	Medical Physics	3	2
الأول/الفصل الدراسي 2	NVU10	Computer Skills	2	2
الأول/الفصل الدراسي 2	NVU12	Democracy and Human Rights	2	–

8. مخرجات التعلم المتوقعة للبرنامج
المعرفة
أ1-اكتساب المعرفة واللغة والفهم للقوانين الفيزيائية والحيوية والرياضية والتحليلية في مجالات نمذجة تطبيقات هندسة الطب الحياتي وأيضا اكتساب المعرفة بالمصطلحات الطبية أ2-فهم الأمور الرياضية والبرمجية والأخلاقية توظيفها في حل المشاكل السريرية والمتعلقة بحياة الناس أ3-التمرس في مجال الميكانيك والكهرباء والبرمجة والمبادئ الأساسية للهندسة وتوظيفها لتحليل وتصميم وحل المشكلات في مجال هندسة الطب الحياتي أ4-إدراك ما تم دراسته من مفردات تتعلق في مجال تخصص هندسة الطب الحياتي والتعامل مع المشاكل الطبية الهندسة بعمق علمي هندسي وقراءة الأوراق البحثية ضمن الاختصاص.
المهارات
ب1-إمكانية فهم عمل وتصميم الأجهزة الطبية وبرمجتها والتخطيط لإجراء عدد واسع من التجارب العلمية الهندسة في مواضيع هندسة الطب الحياتي مع إمكانية صيانة هذه الاجهزة ب2-اقتراح وتنفيذ وبرمجة مخططات لتصاميم أجهزة طبية بما يتوافق مع احتياجات سوق العمل والمشاكل المطروحة ب3-تحليل البيانات الطبية او الطبية الهندسية من خلال استخدام حزم الحلول الهندسة والبرمجة بدقة مناسبة ب4-حضور ورش العمل المقامة من قبل الشركات المتخصصة المحلية او العلمية باللغة الانكليزية في مجال هندسة الطب الحياتي والاطلاع على المشاكل و اقتراح الحلول .
القيم

ج1-تحضير الدروس اليومية الحضورية بشكل منتظم بالإضافة الى حضور المحاضرات الالكترونية
ج2-قيام الطالب بأنشطة مختلفة تتضمن تنفيذ التجارب المختبرية واعداد التقارير واعداد وتنفيذ مشاريع عملية وإقامة العروض التقدمية للمشاريع العملية او للحلقات النقاشية
ج3-اجراء الاختبارات اليومية والفصلية بشكل مكثف بالإضافة الى الواجبات اليومية والعروض التقدمية
ج4-الاستعانة بمحاضرات خارجية إضافية من الشركات المتخصصة بالأجهزة الطبية او من أطباء من اجل الاطلاع على مشاكلهم ومحاولة إيجاد الحلول الملائمة و مواكبة سوق العمل.

9. استراتيجيات التعليم والتعلم

1-عمل مجاميع بحثية لكل مجموعه من الطلبة لأجل اجراء المناقشات وسماع الأفكار المختلفة وترسيخ روح الفريق وعمل مشاريع معينه ضمن تخصص هندسة الطب الحياتي
2-قراءة الأوراق البحثية والكتب المنهجية الرصينة والحديثة واعداد ملخصات عنها
3-متابعة و حضور محاضرات خارجية لشركات او أطباء او زملاء من نفس التخصص من اجل التركيز على متطلبات سوق العمل من خلال مناقشة احتياجات السوق

10. طرائق التقييم

1-اعداد الواجبات البيتية والواجبات داخل الفصل الدراسي وتقديم التقارير عن مواضيع علمية ضمن تخصص هندسة الطب الحياتي
2-اجراء المناقشات العلمية المكثفة داخل القاعة الدراسية وتشجيع الطلبة على مشاركة الأفكار وابداء الآراء وتقبل الرائي الاخر
3-القيام بأنشطة متنوعة مثل القيام بعمل مشاريع وكتابة تقرير وعمل سمنار حول موضوع معين ضمن تخصص هندسة الطب الحياتي.
4-اختبارات فصلية و يومية بالإضافة الى قيام الطالب بعمل سمنارات متنوعه و متعددة.

11. الهيئة التدريسية

أعضاء هيئة التدريس

ت	الاسم و اللقب	اللقب العلمي	الشهادة	العنوان الوظيفي	الاختصاص العام	الاختصاص الدقيق
1	يونس محمود عبوش	أستاذ مساعد	دكتوراه	تدريسي	هندسة كهرباء	اتصالات
2	ضياء محمد علي	أستاذ مساعد	دكتوراه	تدريسي	هندسة كهرباء	اتصالات
3	د خالد غانم مجيد الغبشة	أستاذ مساعد	دكتوراه	تدريسي	فيزياء	فيزياء طبية

4	د ماجد ضرار يونس	مدرس	دكتوراه	تدريسي	هندسة كهرباء	حاسبات
5	د شيماء عبد الهادي جاسم	مدرس	دكتوراه	تدريسي	علوم	فسلجه انسان
6	محمد مزاحم عزيز	مدرس	ماجستير	تدريسي	هندسة حاسوب	شبكات حاسوب
7	دينا نمير عبدالجبار	مدرس مساعد	ماجستير	تدريسي	هندسة الكترونيك	حالة صلبة
8	عمر فاروق عقيل احمد	مدرس مساعد	ماجستير	تدريسي	هندسة كهرباء	هندسة طب حياتي
9	سيماء خالد نافع	مدرس مساعد	ماجستير	تدريسي	هندسة اتصالات	اتصالات
10	براء يعقوب يوسف	مدرس مساعد	ماجستير	تدريسي	علوم	فسلجه حيوان
11	ضحى هاشم خليل	مدرس مساعد	ماجستير	تدريسي	علوم	فيزياء
12	امامة قاسم فتحي	مدرس مساعد	ماجستير	تدريسي	علوم	فسلجه حيوان
13	مها عبدالله محمد	مدرس مساعد	ماجستير	تدريسي	اداب انكليزي	ترجمة
14	سيماء عباس جوده	مدرس مساعد	ماجستير	تدريسي	هندسة اتصالات	اتصالات

التطوير المهني
توجيه أعضاء هيئة التدريس الجدد
1-توجية أعضاء الهيئة التدريسية الجدد بضرورة حضور المحاضرات العلمية التخصصية لهندسة الطب الحياتي للتدريسيين ذوي التخصص الدقيق لأجل تبادل الخبرات 2-مشاركتهم في الاشراف على انجاز المشاريع العلمية الهندسية للطلبة ضمن تخصص هندسة الطب الحياتي
التطوير المهني لأعضاء هيئة التدريس
1-القيام بزيارات ميدانية للأقسام العلمية المناظرة والاطلاع على مناهجهم ومختبراتهم وأجهزة المختبر وتبادل الخبرات العلمية والعملية 2-حضور المؤتمرات العلمية حضوريا او إلكترونيا لهندسه الطب الحياتي و الاطلاع على اخر ما توصلت الية الجامعات العلمية

12. معيار القبول
قبول مركزي من الوزارة

13. أهم مصادر المعلومات عن البرنامج
- 1- وزارة التعليم العالي والبحث العلمي. www.en.mohesr.gov.iq 2-الموقع الرسمي لكلية هندسة الالكترونيات/جامعه نينوى https://uoninevah.edu.iq 3- الموقع الالكتروني لكلية هندسة الالكترونيات https://uoninevah.edu.iq/ee 4-المواقع الالكترونية للأقسام العلمية في الجامعات العالمية المناظرة

14. خطة تطوير البرنامج

1–تحديث المناهج بشكل مستمر، الاطلاع على المناهج في الأقسام المناظرة في الجامعات العالمية

2– الاطلاع على المحاضرات ومشاريع التخرج والبحوث والمختبرات في الجامعات العالمية والمحلية التي تحتوي على اقسام علمية مناظرة وشراء المستلزمات الضروري للمختبرات

3–ابرام اتفاقيات مع الجامعات العلمية الرصينة من اجل تبادل الخبرات

4–القيام بأجراء مسابقات علمية للطلبة من خلال التنافس لإنجاز افضل مشروع طبي هندسي ضمن تخصص هندسة الطب الحياتي

مخطط مهارات البرنامج

السنة / المستوى	رمز المقرر	اسم المقرر	اساسي أم اختياري	مخرجات التعلم المطلوبة من البرنامج											
				المعرفة				المهارات				القيم			
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4
الاول/الفصل الدراسي 1	NVEE215	DC Circuits Analysis	اساسي	●	●	●	●	●	●	●	●	●	●	●	●
الاول/الفصل الدراسي 1	NVEE206	Mathematics I	اساسي	●	●	●	●			●	●	●		●	●
الاول/الفصل الدراسي 1	NVEE217	Digital Techniques	اساسي	●	●		●		●	●	●	●	●	●	●
الاول/الفصل الدراسي 1	NVEE201	Engineering drawing	اساسي	●	●		●	●	●		●	●	●		●
الاول/الفصل الدراسي 1	NVEEBM105	Chemistry	اساسي	●	●		●		●	●	●	●	●	●	●
الاول/الفصل الدراسي 1	NVEEBM11	English	اساسي	●			●			●		●	●		●

●	●	●	●	●	●	●	●	●	●	●	●	اساسي	AC Circuit Analysis	NVEE216	الأول/الفصل الدراسي 2
●	●		●	●	●			●	●	●	●	اساسي	Mathematics II	NVEE207	الأول/الفصل الدراسي 2
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	Computer programming	NVEEBM109	الأول/الفصل الدراسي 2
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	Medical Physics	NVEEBM111	الأول/الفصل الدراسي 2
	●	●	●		●	●	●		●	●		اساسي	Computer Skills	NVU10	الأول/الفصل الدراسي 2
	●		●	●						●		اساسي	Democracy and Human Rights	NVU12	الأول/الفصل الدراسي 2

● يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقيم

نموذج وصف المقرر الدراسي حسب نظام بولونيا لقسم هندسة الطب الحياتي يتضمن:

1- دليل البرنامج الدراسي (Program Catalogue) 2023-2024

2- دليل المواد الدراسي (Modules Catalogue) 2023-2024 للمرحلة الأولى فقط كون قسم هندسة الطب الحياتي تم افتتاحه 2023-2024 ويوجد به حاليا مرحلة أولى فقط.

Ninevah University
جامعة نينوى

First Cycle – Bachelor's degree (B.Sc.) – Biomedical Engineering

بكالوريوس هندسة - هندسة الطب الحياتي

دليل البرنامج الدراسي2023-2024

Program Catalogue

1. Mission & Vision Statement

Vision Statement

The vision of the Biomedical Engineer (BME) department is to offer a bachelor's degree in the science of biomedical engineering that leads the way in innovation, developing impactful cutting-edge technologies, and preparing highly talented students for success as multidisciplinary global leaders across the fields of engineering, healthcare, and biomedical sciences. The BME department endeavor for transformative education that equips students with skills, knowledge, and ethics to shape the future. By merging theory and practical learning, the graduate of the BME department is prepared to drive technological innovation, solve real problems and address challenges that impact positively society.

Mission Statement

The Department of Biomedical Engineering looks forward to collaborating with local and international scientific departments, particularly complementary medical specialties within the Ministry of Higher Education and the Ministry of Health. The BME department promotes and supports the collaborative and inclusive student learning experience. Biomedical engineers create informatics approaches to prevent, diagnose and treat disease, applying systematic, quantitative, and integrative thinking and solutions to problems important to biology.

1. بيان المهمة والرؤية

يتطلع قسم هندسة الطب الحياتي الى التعاون مع الاقسام العلمية المناظرة المحلية والدولية وبصورة خاصة مع الاختصاصات الطبية المكملة في وزارة التعليم العالي ووزارة الصحة. وان القسم في طور التكوين وكذلك الانفتاح على المجتمع وتسخير مكانية القسم المادية والبشرية لخدمة المجتمع. كما ويسعى القسم الى مجاراة الحاجة الحقيقية المتغيرة للمجتمع الهندسي الطبي في اقسامه المختلفة من خلال متابعة وتحديث المناهج وتطويرها بما يتناسب مع المتغيرات المختلفة ابتداءا من الحاجة المتغيرة وصولا الى القفزات التكنولوجية المختلفة في مجالات العلوم الطبية.

2. Program Specification

Programme code:	BSc-BME	**ECTS**	300
Duration:	5 levels (years) 10 Semesters	**Method of Attendance:**	Full Time

Acknowledging the significant impact of medicine and technology in our everyday lives, it became crucial to adapt and provide education that outfits the evolving landscape. Consequently, the College of Electronics Engineering took a proactive step in 2023 by introducing a dedicated undergraduate program in Biomedical Engineering in Nineveh province. This program was meticulously crafted to equip students with a thorough comprehension of the fundamental subjects that underpin this field through a diverse array of courses to equip students with the necessary skills and knowledge to navigate dynamic challenges.

The program follows a structured curriculum and adopts a research-oriented ethos from the outset, integrating practical within lecture modules or dedicated practical modules, as well as facilitating research seminars and tutorials. Furthermore, the program offers opportunities for summer training in hospitals and internships, Individual needs and preferences are discussed with the appropriate tutors, and accommodations are made whenever possible to ensure a fulfilling and well-rounded educational experience.

2. مواصفات البرنامج

نظرا للتطور الحاصل في مجال الطب الحياتي عالميا ومحليا، وتداخل الاختصاص الهندسي والطبي في كثير من التطبيقات الحديثة، أصبح من اللازم مواكبة هذا التطور من خلال استحداث قسم الطب الحياتي لرفد المنشآت الطبية والتعليمية بهذا التخصص النادر. اخذت كلية هندسة الالكترونيات على عاتقها مبادرة استحداث قسم هندسة الطب الحياتي عام 2023 لدراسة البكالوريوس مستعينا بخيرة اساتذتها، حيث تم تصميم البرنامج الأكاديمي بعناية لتلبية احتياجات سوق العمل اولاً وتدريس الطلبة المقبولين في القسم مختلف المواضيع العلمية الحديثة. وتهيئة الطلبة وإعدادهم لمواجهة تحديات العصر الحديث. يتبع البرنامج الأكاديمي لقسم هندسة الطب الحياتي منهجًا منظمًا وموجهة نحو البحث العلمي، من خلال اعداد البحوث والحلقات النقاشية الموسعة والتجارب العلمية والكورسات العلمية المكثفة كما ويوفر البرنامج فرصًا للتدريب الصيفي في المستشفيات

3. Program Goals

- To enrich students with opportunities for education in the field of Biomedical engineering through undergraduate research, internships, and study abroad.
- Building an engineer who is distinguished by his scientific and practical knowledge of engineering applications in all health and medical fields, and that he has distinguished knowledge so that it gives him the ability to design, develop, maintain, and operate modern medical devices in a way that contributes to providing the scientific and medical movement and contributing to conducting research related to the medical and life aspect.
- An engineering graduate capable of applying advanced diagnostic and therapeutic concepts associated with modern engineering techniques in the medical field
- Preparing engineering staff with a good medical background that enables them to communicate with all parties to the medical community to cover the requirements of the Iraqi Ministry of Health for this specialization
- Contributing to the student's scientific and knowledge construction in the specialty of life medical engineering and encouraging him to pay attention to scientific research to keep pace with the development in the field of specialization. As well as updating his information from time to time by urging the student to self -learning and using programs that are invented from time to time

3. اهداف القسم

- توفير فرص تعلم عالية المستوى في مجال هندسة الطب الحياتي من خلال انجاز مشاريع تخرج متميزة، والحصول على فرص تدريب جيدة، كذألك من خلال الحصول على زمالات دراسية خارج العراق.
- بناء مهندس يتميز بمعرفته العلمية والعملية للتطبيقات الهندسية في المجالات الصحية والطبية كافة، وان تكون له المعرفة المتميزة بحيث تمنحه القدرة على تصميم وتطوير وصيانة وتشغيل الاجهزة الطبية الحديثة بما يساهم في رفد الحركة العلمية والطبية والمساهمة في اجراء البحوث ذات العلاقة بالجانب الطبي والحياتي.
- خريج مهندس قادر على تطبيق المفاهيم التشخيصية والعلاجية المتقدمة المرتبطة بالتقنيات الهندسية الحديثة في المجال الطبي.
- اعداد ملكات هندسية ذات خلفية طبية جيدة تمكنه من التواصل مع جميع أطراف المجتمع الطبي لتغطية متطلبات وزارة الصحة العراقية لهذا الاختصاص.
- المساهمة في البناء العلمي والمعرفي للطالب في تخصص هندسة الطب الحياتي وتشجيعه على الاهتمام بالبحث العلمي لمواكبة التطور الحاصل في مجال التخصص. وكذلك تحديث معلوماته بين الحين والاخر من خلال حث الطالب على التعلم الذاتي واستخدام البرامج التي تبتكر بين فترة واخرى.

4. Student Learning Outcomes

- Knowing of basic principles of engineering and biomedical sciences to understand advanced topics in biomedical engineering
- The ability to use useful techniques, skills, and tools to design biomedical projects, experimental studies, and engineering practices
- Acquiring the fundamental skills that qualify him to prepare the requirements for designing modern hospitals, healthcare centers, and other healthcare facilities.
- Understand the professional and ethical responsibility of a medical engineer
- To familiarize the student with the most important computer and mathematical software that is used in the field of designing and solving engineering problems and the foundations of their theoretical applications
- ability to understand and design engineering in areas of biomedical engineering including molecular, cellular, and nanoscale biomaterials and tissue engineering, medical device and systems engineering, biomechanics, and rehabilitation engineering, biomedical optics, physiological systems modeling, hospital and healthcare design, and bioengineering. Computational and biomedical imaging
- The ability to keep track of scientific development in the fields of biomedical engineering
- Preparing engineering designs and developing medical devices and equipment

4. مخرجات التعلم للطالب

- معرفة المبادئ الأساسية للهندسة والعلوم الطبية الحيوية اللازمة لفهم الموضوعات المتقدمة في الهندسة الطبية الحيوية
- القدرة على استخدام التقنيات والمهارات والأدوات المفيدة لتصميم المشاريع الطبية الحيوية، والدراسات التجريبية، والممارسة الهندسية
- اكتساب المهارات الأساسية التي تؤهله الى إعداد متطلبات تصميم المستشفيات الحديثة والمراكز الصحية والوحدات الصحية الأخرى.
- فهم المسؤولية المهنية والأخلاقية التي تقع على عاتق المهندس الطبي.
- ان يلم الطالب على أهم البرمجيات الحاسوبية والرياضية التي تستخدم في مجال تصميم وحل المشاكل الهندسية وأسس تطبيقاتها النظرية
- القدرة على الفهم والتصميم الهندسي في مجالات الهندسة الطبية الحيوية بما في ذلك الجزيئية، الخلوية، والنانوية المواد الحيوية وهندسة الأنسجة، هندسة الاجهزة والنظم الطبية، الميكانيك الاحيائي، وهندسة إعادة التأهيل، البصريات الطبية الحيوية، نمذجة النظم الفيزيولوجية، تصميم المستشفيات ومراكز الرعاية الصحية والهندسة الحيوية الحاسوبية والتصوير الطبي الحيوي.
- القدرة على مواكبة التطور العلمي في مجالات الهندسة الطبية الحيوية.
- أعداد التصاميم الهندسية وتطوير الأجهزة والمنظومات والمعدات الطبية

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6. Credits, Grading, and GPA

Credits

Nineveh University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 300, 30 ECTS per semester 1 ECTS is equivalent to 25 hrs. student workload, including structured and unstructured workload.

الاعتمادات

تتابع جامعة نينوى عملية بولونيا من خلال نظام ائتمان نظام تحويل الرصيد الأوروبي(ECTS) جمالي عدد برنامج درجة ECTS هو 300، 30 ECTS لكل فصل دراسي. 1 ECTS ما يعادل 25 ساعة من عبء عمل الطالب، بما في ذلك عبء العمل المنظم وغير المنظم.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

وضع العلامات

قبل التقييم، يتم تقسيم النتائج إلى مجموعتين فرعيتين: النجاح والفشل. لذلك، فإن النتائج مستقلة عن الطلاب الذين فشلوا في الدورة. يتم تعريف نظام الدرجات على النحو التالي:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	**التقدير**	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work is required but credit awarded
	F – Fail	راسب	(0-44)	A considerable amount of work required
Note:				
Number of Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. سيتم تقريب الأرقام العشرية أعلى أو أقل من 0.5 إلى العلامة الكاملة الأعلى أو الأدنى (على سبيل المثال، سيتم تقريب علامة 54.5 إلى 55، في حين سيتم تقريب علامة 54.4 إلى 54. لدى الجامعة سياسة عدم التغاضي " فشل التقريب القريب "لذا فإن التعديل الوحيد للعلامات الممنوحة بواسطة العلامة (العلامات) الأصلية سيكون التقريب التلقائي الموضح أعلاه.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

   CGPA of a 5-year B.Sc. degree:

   CGPA = [(1st module score x ECTS) + (2nd module score x ECTS) + ……] / 300

حساب المعدل التراكمي للدرجات(CGPA)

1. يتم حساب المعدل التراكمي المعدل التراكمي **(**CGPA**)** من خلال مجموع نقاط كل وحدة مضروبة في نظام ECTS الخاص بها، وكلها مقسمة على إجمالي ECTS للبرنامج.

   CGPA لـ 5 سنوات بكالوريوس. درجة:

المعدل التراكمي CGPA = 300/[(درجة المادة الدراسية الأولى ×**عدد الوحدات الخاص بها** (ECTS) + (درجة المادة الدراسية الثانية × **عدد الوحدات الخاص بها** (ECTS)+.....]

Note:

CGPA: Grade Point Average

ECTS: The European Credit Transfer and Accumulation System

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module Name in English	اسم المادة الدراسية	SSWL	USSWL	ECTS	Type	Pre-request
NVEE215	DC Circuit Analysis	تحليل دوائر التيار المستمر	93	82	7	C	
NVEE206	Mathematics I	الرياضيات I	63	87	6	B	
NVEE217	Digital Techniques	التقنيات الرقمية	60	65	5	B	
NVEE201	Engineering drawing	الرسم الهندسي	63	37	4	S	
NVEEBM105	Chemistry	كيمياء	48	77	5	S	
NVEEBM11	English	اللغة الانكليزية	60	15	3	S	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module Name in English	اسم المادة الدراسية	SSWL	USSWL	ECTS	Type	Pre-request
NVEE216	AC Circuit Analysis	تحليل دوائر التيار المتناوب	93	82	7	C	NVEE215
NVEE207	Mathematics II	الرياضيات II	63	87	6	B	NVEE206
NVEEBM109	Computer programming	برمجة الحاسوب	78	72	6	B	
NVEEBM111	Medical Physics	الفيزياء الطبية	78	72	6	C	
NV‘U12	Democracy and Human Rights	ديمقراطية وحقوق الانسان	33	17	2	B	
NVU10	Computer Skills	مهارات الحاسوب	63	12	3	S	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module Name in English	اسم المادة الدراسية	SSWL	USSWL	ECTS	Type	Pre-request
NVEEBM201	Electronics I	دوائر الكترونية I	93	57	6.00	C	
NVEE208	Engineering Analysis	التحليلات الهندسية	63	90	6	B	NVEE207
NVEEBM110	Bio-Chemistry	الكيمياء الحياتية	78	47	5.00	C	NVEEBM105
NVEEBM203	Mechanical Engineering 1	الهندسة الميكانيكية1	48	77	5.00	B	
NVEE220	Electromagnetic Fields	المجالات الكهرومغناطيسية	63	90	6	C	
NVU13	The Crimes of the Bath regime in iraq	جرائم نظام البعث في العراق	30	20	2	S	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module Name in English	اسم المادة الدراسية	SSWL	USSWL	ECTS	Type	Pre-request
NVEE210	Signals and Systems	اشارات ونظم	93	57	6.00	C	NVEE208
NVEEBM208	Electronics II	دوائر الكترونية II	93	57	6.00	C	NVEEBM201
NVEEBM209	Statistics and Probability	الإحصاء والاحتمالية	48	77	5.00	B	
NVEEBM210	Engineering Mechanics II	الهندسة الميكانيكية II	48	52	4.00	B	NVEEBM203
NVEEBM211	Limbs Anatomy	تشريح الأطراف	78	72	6.00	C	
NVEE202	Industrial Management & Ethics	ادارة صناعية واخلاقيات	48	27	3.00	S	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module Name in English	اسم المادة الدراسية	SSWL	USSWL	ECTS	Type	Pre-request
NVEE204	Digital Signal Processing	معالجة الاشارة الرقمية	78	47	5.00	B	NVEE210
NVEEBM302	Antenna	الهوائيات	78	72	6.00	C	NVEE220
NVEEBM303	Ionic Waves & Propagation I	الموجات المؤينة والانتشار I	63	62	5.00	C	
NVEEBM304	Biomedical Electronics	الإلكترونيات الطبية الحيوية	78	72	6.00	C	NVEEBM208
NVEEBM305	Head & Neck Anatomy	تشريح الرأس والرقبة	63	62	5.00	C	
NVEEBM306	Physiology I	علم وظائف الأعضاء I	48	27	3.00	S	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module Name in English	اسم المادة الدراسية	SSWL	USSWL	ECTS	Type	Pre-request
NVEEBM307	Biomedical Signal Analysis	تحليلات الاشارات الحيوية	63	37	4.00	B	NVEE204
NVEEBM308	Microprocessors	معالجات دقيقة	63	87	6.00	C	
NVEEBM309	Ionic Waves & Propagation I I	الموجات المؤينة والانتشار II	63	62	5.00	C	NVEEBM303
NVEEBM310	Biomedical sensors	متحسسات الطب الحيوي	78	97	7.00	B	
NVEEBM311	Cell Biology	بيولوجيا الخلية	63	62	5.00	B	
NVEEBM312	Physiology II	علم وظائف الأعضاء II	48	27	3.00	S	NVEEBM306

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module Name in English	اسم المادة الدراسية	SSWL	USSWL	ECTS	Type	Pre-request
NVEE213	Analogue Control	السيطرة التناظرية	63	62	5.00	C	
NVEEBM402	Biomaterials I	علم المواد الحيوية ا	63	62	5.00	C	
NVEEBM403	Medical Instrumentation	الاجهزة الطبية	78	72	6.00	C	
NVEEBM404	Modern Imaging Equipment I	اجهزة التصوير الطبي الحديثة ا	63	87	6.00	C	
NVEEBM405	Pathology	علم الأمراض	48	52	4.00	C	
NVEE222	Communications Principles	مبادئ الاتصالات	63	37	4.00	S	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module Name in English	اسم المادة الدراسية	SSWL	USSWL	ECTS	Type	Pre-request
NVEE214	Digital Control	السيطرة الرقمية	63	62	5.00	C	NVEE213
NVEEBM408	Biomaterials II	علم المواد الحيويةII	63	62	5.00	C	NVEEBM402
NVEEBM409	Therapeutic Instrumentation	الاجهزة العلاجية	78	72	6.00	C	
NVEEBM410	Modern Imaging Equipment II	اجهزة التصوير الطبية الحديثةII	63	87	6.00	C	NVEEBM404
NVEEBM411	Thermo-Fluid Mechanics	ميكانيك الموائع الحرارية	48	52	4.00	C	
NVEEBM412	Digital Communications	الاتصالات الرقمية	63	37	4.00	S	NVEE222

Semester 9 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module Name in English	اسم المادة الدراسية	SSWL	USSWL	ECTS	Type	Pre-request
NVEEBM501	Diagnostic Instrumentation	الاجهزة التشخيصية	63	87	6.00	C	
NVEEBM502	Digital Image Processing	معالجة الصور الرقمية	78	72	6.00	C	NVEE204
NVEEBM503	Medical Optics & Fiber	البصريات الطبية والالياف	48	77	5.00	C	
NVEEBM504	Computer Network for Medical Application I	شبكات الحاسوب للتطبيقات الطبية I	63	62	5.00	C	
NVEEBM505	Biomechanics I	تصميم الميكانيكا الحيوية الكهربية I	63	62	5.00	C	
NVEE211	Design of graduation project	تصميم مشروع التخرج	33	42	3.00	S	

Semester 10 | 30 ECTS | 1 ECTS = 26 hrs.

Code	Module Name in English	اسم المادة الدراسية	SSWL	USSWL	ECTS	Type	Pre-request
NVEEBM507	Image Processing for BME	معالجة الصور الطبية	78	72	6.00	C	NVEEBM502
NVEEBM508	Biomechanics I I	تصميم الميكانيكا الحيوية الكهربية II	63	62	5.00	C	NVEEBM505
NVEEBM509	Computer Network for Medical Application II	شبكات الحاسوب للتطبيقات الطبية II	63	62	5.00	C	NVEEBM504
NVEEBM510	Robotics in Medicine	الروبوتات في الطب	63	62	5.00	C	
NVEEBM511	Neural Networks & AI	الشبكات العصبية والذكاء الصناعي	78	47	5.00	C	
NVEE212	Implementation of graduation project	تنفيذ مشروع التخرج	62	38	4.00	S	NVEEBM506

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Ninevah University
جامعة نينوى

First Cycle – Bachelor's Degree (B.Sc.) – *Biomedical Engineering*

بكالوريوس - هندسة طب حياتي

دليل المواد الدراسية 2023 – 2024

Modules Catalogue

Table of Contents

1. Overview

This catalogue is about the courses (modules) given by the program of Biomedical Engineering to gain the Bachelor of Science degree. The program delivers (60) Modules with (7500) total student workload hours and 300 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامة

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة الطب الحياتي للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (60) مادة دراسية، مع (7500) إجمالي ساعات حمل الطالب و 300 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على مسار بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
NVEE215	DC Circuits Analysis	7	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3	93	82
Description			
The analysis of electrical circuits is summarize by the ability to use the basic laws, namely Ohm's law and Kirchhoff's law for current and voltage, and applying them to circuits in order to find the current of any branch or the voltage difference for any element in the circuit, including calculating the supplied and consumed power for all circuit elements, in addition to understanding the theories derived from the two basic laws above To analyze circuits such as Theven and Norton theory and other theories and to understand the difference between DC circuits and alternating current circuits in analysis and the			

close relationship between frequency, impedance calculation and phase difference on the one hand and the power factor and real power on the other hand and how to improve the power factor. In addition to understanding the transient state and the time constant of circuits of the first degree. Finally, ability to use the best methods for any problem in the live.

Module 2

Code	Course/Module Title	ECTS	Semester
NVEE206	Mathematics I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
This calculus course for first-year of bio medical engineering students provides a comprehensive foundation in calculus concepts and their practical applications. The course covers topics such as vectors, complex numbers, matrices, determinants, and differentiation techniques including the chain rule and implicit differentiation. Students will develop proficiency in differentiating trigonometric, exponential, logarithmic, and inverse trigonometric functions. The course also delves into definite integration and its applications in finding areas, volumes, and lengths. Emphasis is placed on problem-solving, critical thinking, and the ability to apply calculus principles to engineering scenarios. Through interactive classes, tutorials, and hands-on experiments, students will engage actively, refine their critical thinking skills, and gain a deeper understanding of calculus concepts relevant to control engineering.			

Module 3

Code	Course/Module Title	ECTS	Semester
NVEE217	Digital Techniques	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	60	65

Description
The Digital Techniques module is design to provide students with a comprehensive understanding of digital technologies and their applications. The module covers a wide range of topics related to digital techniques, including logic gates, digital circuits, Boolean algebra, digital systems, and data transmission. Throughout the module, students will learn digital techniques' fundamental principles and concepts. They will explore the building blocks of digital systems, such as logic gates, flip-flops, and registers, and understand how these components are interconnect to create complex digital circuits. The module also introduces students to Boolean algebra, which is essential for designing and analyzing digital systems. In addition to theoretical concepts, the module emphasizes practical skills and applications. Students will have the opportunity to work with digital design software and hardware tools to implement and simulate digital circuits. They will learn about various digital technologies, such as multiplexers, decoders, and encoders, and understand their functions and applications.

Module 4

Code	Course/Module Title	ECTS	Semester
NVEE201	Engineering drawing	4	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	60	40
Description			
AutoCAD is a computer-aided design (CAD) software developed by Autodesk. It is widely used in various industries such as architecture, engineering, and manufacturing to create precise 2D and 3D designs and technical drawings. AutoCAD provides a comprehensive set of tools and features that allow users to create, modify, and document their designs with great accuracy and efficiency. The software offers a user-friendly interface and supports both command-line and graphical interaction, making it accessible to users with different levels of expertise. With AutoCAD, designers can create geometric shapes, lines, and curves using basic drawing tools or by inputting precise dimensions. The software also enables the creation of complex 3D models by extruding, revolving, or lofting 2D profiles. AutoCAD facilitates the creation of detailed technical drawings by providing tools for dimensioning, annotation, and hatching. Users can add text, symbols, and labels to communicate important information about the design. The software supports the creation of multi-sheet drawings and the organization of design data through layers, which allow for efficient management and control over different elements of the drawing.			

Module 5

Code	Course/Module Title	ECTS	Semester
NVEEBM105	Chemistry	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	77
Description			
Measurement and Properties of Matter, Metric System, Unit Conversion, Significant Figures, Characteristics of Matter, Gases and its application in medicine, Characteristics of Gases, Daltons law, Boyels law, Charles law, Solutions, Molarity and normality, Isotonic solutions, Precipitation Analysis, Dilution, Osmosis and Osmotic Pressure of solutions, Acids and Bases, Ionization of Water, PH and its measurement, Buffers solution, Blood buffers, Acid-Base titration, Acid-Base Balance, Nuclear Chemistry, Radioactivity, Detection devices, Physiological effects of radiation, Isotopes, Uses of radioisotopes in medicine, Isomerism (Stereochemistry). Introduction and Carbohydrates metabolism, the definition of biochemistry, the definition of clinical biochemistry, the definition of metabolism (anabolism, catabolism), Digestion of Carbohydrates, The fate of glucose in living organisms (glycolysis, gluconeogenesis, glycogenesis, glycogenesis), Citric acid cycle, ATP formation, Oxidation, Phosphorylation, Lipid Metabolism, Digestion, Glycerol, Triacylglycerols, Fatty acids, Ketone bodies, Lipid profile, Proteins Metabolism, Digestion of proteins, Amino acid, urea cycle, Enzymes, The interrelationship and control of metabolism, Interrelationships among metabolic pathways, Major metabolic activities of the various organs in humans, Control of metabolism, Blood, Diseases due to errors in metabolism, Diabetes and Hyperlipidemia, Hormone, Classification, their abnormalities, Minerals, Vitamins and their abnormalities.			

Module 6

Code	Course/Module Title	ECTS	Semester
NEBM112	English language	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	60	15
Description			
Ask and respond to simple, routine, and predictable questions about personal information, communicate some basic needs in informal conversations, understand key words, some phrases, simple commands, and short sentences in simple conversations, read a simple text that is related to daily life and experience. Topics include routine events, descriptions of people, places and things and simple instructions, etc., Write a few sentences and phrases about topics that are familiar to the student: family, travel, food, health, etc., Show some control over basic grammatical structures to communicate basic needs, Follow simple personal information questions and commands or directions related to a familiar context, Ask and respond to simple, routine questions on very familiar topics (e.g. where he/she			

lives and people he/she knows), Build vocabulary about different common everyday topics to be able to express him/herself clearly. Communicate in short routine conversations about needs and familiar day-to-day topics, Ask and respond to simple and familiar questions, Describe a situation, tell a simple story, and describe the process of obtaining basic goods and/or services using a variety of short sentences, Read a simple 2-3 paragraph passage about daily life and experience, Write simple descriptions of events, stories, future plans, or other familiar topics, Effectively communicate in writing ideas and information about personal experience and everyday needs, Communicate in short routine conversations about needs and familiar topics of personal relevance, Ask and respond to simple and familiar questions, Describe situations of personal relevance

The main strategy that will be adopted in delivering this module is to encourage students' participation by reading, writing and comprehension in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, presentation, interactive tutorials, by considering type of simple experiments involving some sampling activities that are interesting to the study. This can be achieved through encouraging the students to express their scientific projects in English language and develop their abilities in simple approach

Module 7

Code	Course/Module Title	ECTS	Semester
NVEE216	AC Circuit Analysis	7	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	93	82
Description			
The analysis of electrical circuits is summarized by the ability to use the basic laws, namely Ohm's law and Kirchhoff's law for current and voltage, and applying them to circuits in order to find the current of any branch or the voltage difference for any element in the circuit, including calculating the supplied and consumed power for all circuit elements, in addition to understanding the theories derived from the two basic laws above To analyze circuits such as Theven and Norton theory and other theories and to understand the difference between DC circuits and alternating current circuits in analysis and the close relationship between frequency, impedance calculation and phase difference on the one hand and the power factor and real power on the other hand and how to improve the power factor. In addition to understanding the transient state and the time constant of circuits of the first degree. Finally, a ability to use the best methods for any problem in the live.			

Module 8

Code	Course/Module Title	ECTS	Semester
NVEE207	Mathematics II	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
This second-semester course in Biomedical Engineering focuses on advanced topics in calculus. Students will delve into methods of integration, including trigonometric substitutions, partial fractions, and integration by parts. They will also explore vector calculus principles, such as the del operator, gradient, divergence, and curl, and their application in system and control engineering. The course covers polar and cylindrical coordinate systems, enabling students to graph functions in these coordinates. Additionally, the study of sequences and series includes convergence tests and the analysis of alternating series. Power series and Taylor series expansions are introduced for function approximation. Through problem-solving exercises and real-world applications, students will develop critical thinking and problem-solving skills, preparing them to apply calculus concepts to complex engineering problems in system and control engineering.			

Module 9

Code	Course/Module Title	ECTS	Semester
NVEEBM109	Computer programming	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2/1	75	75
Description			
The C++ Programming module provides a comprehensive introduction to the C++ programming language, emphasizing its key features, syntax, and best practices. This module serves as a foundation for students pursuing careers in system programming, or other fields that require knowledge of C++. Students will start by learning the basics of C++, including variables, data types, control structures, functions, and arrays. students will gain a comprehensive understanding of programming languages and specifically the features and advantages of C++. They will learn to write and execute simple C++ programs, understand the syntax and structure of C++ programs, differentiate between data types, and effectively use variables, constants, and data types in their programs. By the end of this module, students will have a strong foundation in C++ programming, including understanding programming concepts, designing algorithms, working with variables and data types, making decisions using selection statements, implementing loops, manipulating arrays, and using functions effectively..			

Module 10

Code	Course/Module Title	ECTS	Semester
NVEEBM111	Medical Physics	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2/1	78	72
Description			
Quantities, units, vectors, (Force, Newton's law in motion) Force and Development of Force Concept, Newton's First Law of Motion: Inertia, Second Law of Motion: Concept of a system, Third Law of Motion: Symmetry in Forces. The Electromagnetic Spectrum, properties of light, reflection and refraction, Applied to Reflection and Refraction, Wave Optics, Huygens' Principle Conditions for Interference, Young's Double-Slit Experiment, Optical Instruments (The Camera, The Eye, The Compound Microscope. Sound, Producing a Sound Wave, general properties of sound, The Speed of Sound, units, intensity Level in Decibels, Doppler effects, Shock Waves, application in medicine (Stethoscope, Ultrasound. Pressure, units, Density and Pressure Boyle's law, Pascal principal, hydraulic systems, Archimedes principle, buoyant force, pressure in the human body, Blood Pressure Measurements. (Temperature and Heat), Temperature and phase of mater, temperature scales and thermometer, method of heat transfer, heat and the human body, effects of heat on the body, Calorimetry, diagnostic and therapeutic uses of heat. Quantities and Units in Medical Physics, Physics of the Human Skeleton, Forces on and in the Human Body, Pressure in the Human Body, Physics of Sound and Hearing, Temperature and Heat in the Human Body			

Module 11

Code	Course/Module Title	ECTS	Semester
NVEEBM206	Computer Skills	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	63	12
Description			

Introduction to a computer system – Information technology and computer definitions, computer system characteristics with specific features and functions of cases, power supplies, internal components, internal cables, ports and cables, input devices, output devices, computer classification, and historical developments of computers. Operating system definition and the role of the operating system, characteristics of the operating system, what are the minimum hardware requirements of different Microsoft operating systems, define the file system, explain different file system characteristics. Fundamental concepts of network definition, components and types of computer networks, purpose and characteristics of the network, network standard wired and wireless standards, physical components of a network, cables, connectors, and mode of transmission, internet protocol addressing. Fundamental of laptops and portable devices, laptop power configuration, laptops hardware and component configuration, mobile device hardware overview

Module 12

Code	Course/Module Title	ECTS	Semester
NVU12	Democracy and Human Rights	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	30	20
Description			
The subject of human rights first deals with its emergence as an idea in primitive societies and then in the ancient civilizations of Mesopotamia, Egypt, Greece and Rome, and the position of religions on the concept of human rights in the religions of Islam, Christianity and Judaism, and the divisions of human rights and their guarantees in Islamic law and at the international level. As for democracy, it deals with the issue of freedom and the development of the system of government in terms of defining public freedoms and their legal and historical development and the foundations of the concept of public freedoms such as justice, equality, freedom of expression and thought, and freedom of the media.			

Module 13

Code	Course/Module Title	ECTS	Semester
NVEEBM201	Electronics I	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2/1	93	57
Description			
Semiconductor Diodes: Unbiased PN Junction, Forward & Reverse Biased PN Junction, Diode			

Characteristics: Diode Equation, Diode Equivalent Circuits, Graphical Solution, Breakdown & Biasing a diode, Dc characteristics, power dissipation in a diode, Ripple Voltage and ripple factor, Zenor Diodes, Diode Applications: Rectifiers, Half and full wave rectifiers, wave form shaping Capacitor Filter, Inductor smoothing, L-C smoothing, Clipping & Clamping Circuits, Voltage Regulation, Bipolar Junction Transistor (BJT): Operation of pnp and npn, Current Components, Characteristics of CE, CB & CC Configurations Operating Point and Operating Regions, Biasing the BJT: Fixed Bias, the emitter current, Base common emitter amplifier, Self-Bias Circuits, Equivalent circuit model, Dc analysis of transistor, Load line, h parameters in common emitter. Dc bias with voltage feedback, Dc or static characteristic of the transistor, Limitation of the transistor. Design of dc bias circuits, design of current gain stabilized, Small Signal Low Frequency Analysis: Transistor amplifier, Ac equivalent circuit Graphical Analysis, Two Port Devices & The BJT Hybrid Model, Conversion Formulas, Comparison of BJT Amplifier Configurations, Cascading Amplifiers, Simplified Models, Frequency response of RC coupled amplifier and high performance of RC coupled amplifier.

Module 14

Code	Course/Module Title	ECTS	Semester
NVEE208	Engineering Analysis	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	60	90
Description			
The Engineering Analysis module provides students with a solid foundation in fundamental mathematical concepts and techniques essential for engineering applications. This module aims to develop students' analytical and problem-solving skills through the study of topics such as calculus, and ordinary differential equations.			

Module 15

Code	Course/Module Title	ECTS	Semester
NVEEBM110	Bio-Chemistry	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2/1	78	47
Description			
Biochemistry explores chemical processes related to living organisms. It is a laboratory-based science			

combining biology and chemistry. Biochemists study the structure, composition, and chemical reactions of substances in living systems and, in turn, their functions and ways to control them.

Module 16

Code	Course/Module Title	ECTS	Semester
NVEEBM203	Engineering Mechanics I	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	77
Description			
Introduction into two- and three-dimensional systems, Force systems: two–dimensional force system, moment, couple, resultants, equilibrium, free-body diagrams, Equilibrium Conditions: Two–dimensions, Structures: plane trusses, Frames, Fluid static, Friction, Application of friction: Belts, Distributed forces, center of mass.			

Module 17

Code	Course/Module Title	ECTS	Semester
NVEE220	Electromagnetic Fields	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	60	90
Description			
The main objective of this course is to introduce the fundamental concepts of classical magnetic fields with engineering applications. Biot-Savart's law, magnetic flux, Ampere's Law and its applications. Maxwell equations and its derivative and finally electromagnetic wave propagation and Power and the Pointing Vector.			

Module 18

Code	Course/Module Title	ECTS	Semester
NVU13	The Crimes of the defunct Bath party	2	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	30	20
Description			

Module 19

Code	Course/Module Title	ECTS	Semester
NVEE210	Signals and Systems	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2/1	93	57
Description			
This module introduce the characteristics and properties of signals and systems and provide fundamental tools for their analysis and representation. The module will elaborate on signal representations: continuous and discrete signals; Elementary signals: unit impulse, unit step, real exponential, sinusoids, complex exponential signals; Transformations of the independent variable: time-reversal, time-shift, time-scaling; Periodicity of signals: periods and fundamental period, frequency; Harmonically related signals in CT and DT; Fourier series representation of periodic signals in CT and DT: definitions and properties; Fourier Transform of CT signals: definitions and properties; Time and Frequency domain representations of signals: duality; Systems properties: linearity, causality, time-invariance, memory, stability; LTI systems: impulse response and frequency response; Introduction to filtering and modulation.			

Module 20

Code	Course/Module Title	ECTS	Semester
NVEEBM208	Electronics II	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2/1	93	57

Description
The study of electronics II aims to understand the composition of the bipolar transistor, its working areas, and the types of circuits by which we get the best working point in the active area, in addition to how to analyze the circuits after drawing the continuous and alternating equivalent to determine the type of amplifier, the value of the voltage and current gain of the amplifier, calculate the input and output impedance, and determine the general characteristics of each They are common emitter amplifiers, common base amplifiers, and finally common collector amplifiers. In addition to understanding the impact of the load on the efficiency of each type of amplifiers and the desired benefit from using the multiple stages of the amplifiers. Finally, the effect of frequency on circuit gain and how to calculate the bandwidth. Also Explain the current-voltage relationship of electronic devices study basic concepts of DC biasing also to studies basic differential amplifier using transistor and its configuration

Module 21

Code	Course/Module Title	ECTS	Semester
NVEEBM209	Statistics and Probability	5	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	77
Description			
The module aims to introduce students to fundamental statistical concepts such as data types, variables, population, sample, descriptive statistics, and probability. Students learn about different methods of data collection, including surveys, experiments, and observational studies. They also understand the importance of sampling techniques and how to select an appropriate sample for analysis also Students gain an understanding of probability concepts, including basic principles, conditional probability, independence, and Bayes' theorem. They learn how to calculate probabilities and apply them in real- world scenarios. introduce students to the process of making inferences about populations based on sample data. They learn about confidence intervals and hypothesis testing, including concepts like null and alternative hypotheses, p-values, and significance levels. Many statistics modules include an element of practical work using statistical software such as R, Python, or SPSS. The aim is to familiarize students with the tools used for data analysis, data visualization, and statistical modeling.			

Module 22

Code	Course/Module Title	ECTS	Semester
NVEEBM210	Engineering Mechanics II	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			
Second moment of area and moment of inertias, introduction to dynamics, kinematics of particles: rectilinear motion, plane curvilinear motion, normal and tangential coordinates, polar coordinates, relative motion, kinetics of particles: Newton's second law, rectilinear motion, curvilinear motion, work and kinetic energy, potential energy, impulse and momentum, impact.			

Module 23

Code	Course/Module Title	ECTS	Semester
NVEEBM211	Limbs Anatomy	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2/1	78	72
Description			
Introduction to Anatomy, terms of description and movements, basic anatomical structures I, basic anatomical structures II, radiological and cross sectional anatomy, osteology of the upper limbs, joints of the shoulder girdle, scapular and shoulder muscles, axilla and brachial plexus, arm and elbow joint, cubital fossa and forearm, wrist and hand, functional anatomy of the hand, fascia, veins and lymphatics of the upper limb, nerve injuries in the upper limb, the hip joint and osteology of the femur, the thigh, the gluteal region, the knee joint and popliteal fossa, the leg and its compartments, venous system of lower limb, ankle joint and arches of the foot, the foot, nerve injuries in the lower limb also This module will provide the students with the basic knowledge of human anatomy in the context of macroscopy and microscopic structure, mechanics and function. Also it focus is on the healthy body, with reference to diseases and ageing the student will study the interplay between structure and function, in health, disease and ageing.			

Module 24

Code	Course/Module Title	ECTS	Semester
NVEE202	Industrial Management & Ethics	3	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	48	27
Description			
The module " Industrial Management & Ethics " explores the intersection of ethics and the field of industrial management. It delves into the ethical considerations and challenges that arise in the industrial sector, focusing on topics such as responsible business practices, corporate social responsibility, and ethical decision-making in managerial roles. The module aims to equip students with the knowledge and skills to navigate ethical dilemmas commonly encountered in industrial settings. Through case studies, discussions, and practical exercises, students gain a deeper understanding of the ethical implications of managerial decisions, organizational behavior, and the impact of industrial practices on various stakeholders, including employees, customers, communities, and the environment. Emphasis is placed on promoting ethical leadership, fostering a culture of integrity, and aligning business objectives with ethical standards. By the end of the module, students are expected to develop a strong ethical framework that informs their approach to industrial management, enabling them to make morally responsible decisions and contribute to sustainable and socially conscious business practices.			

Module 25

Code	Course/Module Title	ECTS	Semester
NVEE204	Digital Signal Processing	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	47
Description			
The course covers theory and methods for digital signal processing including basic principles governing the analysis and design of discrete-time systems as signal processing devices. Review of discrete-time linear, time-invariant systems, Fourier transforms and z-transforms. Topics include sampling, impulse response, frequency response, finite and infinite impulse response systems, linear phase systems,			

digital filter design and implementation, discrete-time Fourier transforms, discrete Fourier transform, and the fast Fourier transform algorithms

Module 26

Code	Course/Module Title	ECTS	Semester
NVEEBM302	Antenna	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2/1	78	72
Description			
In this course the student will Understand basic principles of antennas engineering. Analyze, design and evaluate various types of antennas like wire antennas (dipole antenna) , optimize loop antennas and array antennas also Understand and analyze the various phenomena of wave propagation, study of Maxwell's equations and radiation patterns, Become knowledgeable about directivity, gain, beam width, polarization, input impedance, and radiation efficiency			

Module 27

Code	Course/Module Title	ECTS	Semester
NVEEBM303	Ionic Waves & Propagation I	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			
In this course the student will learn and understand the principles of Gama Ray and it is application in hospitals also understand x-ray their applications in medical field To provide the necessary foundation and to gain the required knowledge of theory and the most recent technology in x-rays, and their applications in medical field such as Flat detector, .Fluoroscope, quality control of x-ray image 1, quality control of x-ray image 2, Parameters affecting brightness sharpness, contrast of the x-ray image Image characteristics, Image noise, Introduction to Nuclear Medicine, Basic atomic structure, radioactivity, Collimator, NaI crystal, PMT, the Anger Position Network, PET scan			

Module 28

Code	Course/Module Title	ECTS	Semester
NVEEBM304	Biomedical Electronics	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1/1	78	72
Description			
Understand the fundamental principles of electronics. In particular, gain knowledge in circuit analysis, amplifiers, operational amplifiers, diodes, and transistors. Apply knowledge of engineering and science to identify, formulate, and solve problems in these areas. Learn to design, test, and analyze electronic circuits using oscilloscopes and other electronic test equipment. Apply knowledge of engineering and science to interpret data. Develop an understanding of and develop the skills necessary to communicate findings and interpretations in an effective laboratory report. Apply knowledge of engineering and science to understand the principle of biomedical electronic circuits. Understand how to apply, measure circuit performance, and solve problems in the areas of biomedical signals.			

Module 29

Code	Course/Module Title	ECTS	Semester
NVEEBM305	Head & Neck Anatomy	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1/1	63	62
Description			
Familiarizing the student with basic information about the anatomy of the head and neck region (Scalp, temple and face, Side of neck, Back of neck, Contents of vertebral canal, Cranial cavity, Anterior triangle of neck, Parotid region). Also the student interprets anatomy data in the clinical setting and link anatomical information with clinical practice also student will be able to Determine the normal and abnormal appearances of the anatomical elements in the head and neck region. Information analysis of clinical cases within the framework of a presentation to confirm the macroscopic and embryonic anatomy of the human body			

Module 30

Code	Course/Module Title	ECTS	Semester
NVEEBM306	Physiology I	3	5

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	27
Description			
Body fluids, fluid compartment, water balance, electrolyte balance, RBC, hemoglobin, erythropoiesis, anemia, polycythemia, WBC, immunity, type of immunoglobulins, homeostasis, platelets, external and internal pathways of coagulation, blood groups (ABO system) and transfusion reaction.			

Module 31

Code	Course/Module Title	ECTS	Semester
NVEEBM307	Biomedical Signal Analysis	4	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1/1	63	37
Description			
in this course the student will learn to develop problem solving skills and understanding of digital signal processing through the analysis of application techniques. Also to understand analysis, synthesis and implementation of a given signal and system. This course deals with the basic concept of Biomedical Signal Analysis. Also the basic subject for all digital signal and its application and perform filter design and its analysis such as analog filters - Butterworth filters, Chebyshev filters. Design of IIR filters from analog filters (LPF, HPF, BPF, BRF) - Approximation of derivatives, Impulse invariance method, Bilinear transformation also Design of FIR filters - symmetric and Anti-symmetric FIR filters - design of linear phase FIR filters using Fourier series method - FIR filter design using windows (Rectangular, Hamming and Hamming window), Frequency sampling method. FIR filter structures - linear phase structure, direct form realizations, also Introduction to Adaptive Filters like LMS			

Module 32

Code	Course/Module Title	ECTS	Semester
NVEEBM308	Microprocessors	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1/1	63	87
Description			
In this course the student will learn about the microprocessor and Microcontroller interfacing			

also understand the relation between microprocessor software program and its hardware interfacing. 8086 microprocessor pin diagram in details also how memories are designed and interfaced to microprocessors. Also design various types of applications by studying how 8086 microprocessors is interfaced to different input/output devices and study various types of microprocessor peripherals such as PPI, A/D and D/A. study modern microcontroller as ESP32 and Esp8266-12E and Arduino microcontroller system.also understand modern microcontroller programming in C and C++ and design various types of applications by using modern microcontroller

Module 33

Code	Course/Module Title	ECTS	Semester
NVEEBM309	Ionic Waves & Propagation I I	5	6
Class (hr/w)	**Lect./Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			
In this course student will understand the principles of Gama Ray and it is application in hospitals Also understand x-ray and their applications in medical field and how to use Nuclear Medicine through studying X-Ray detectors / X-ray Image Intensifier., Fluoroscopy, X-Ray detectors / Flat panel detector, Control of x-ray machine and Principles of medical imaging, X-RAY Image characteristics, Introduction to Nuclear Medicine, Basic atomic structure & Radioactivity, Ultrasound, scan PT, Anger Position Network, Image characteristics of PET scan			

Module 34

Code	Course/Module Title	ECTS	Semester
NVEEBM310	Biomedical sensors	7	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1/1	78	97
Description			
Definition, characteristics, principles and requirements, electrodes, definition, electronic CCT, types, surface electrode, needle electrodes, transducers, properties, types, surface electrodes, needle electrodes, resistive transducers, thermometric transducer and medical application, photometric transducers and medical application, optical transducers and medical applications, piezoelectric and			

ultrasound transducers and medical applications, mechanical transducers and medical applications, chemical transducers and medical applications, pressure measurement transducers.

Module 35

Code	Course/Module Title	ECTS	Semester
NVEEBM311	Cell Biology	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			
Introduction to the cell, types of cells, prokaryotes, eukaryotes, cell shapes, cell size, viruses, cell junction, plasma membrane, transport across the plasma membrane, the nucleus, cytoplasm, cytosol, organelles, cytoplasmic inclusions, cytoskeleton, centrosome, cilia and flagella, ribosomes, the endoplasmic reticulum, mitochondria, the Golgi apparatus, lysosomes, peroxisomes, cell division, somatic cells division, reproductive cell division, protein synthesis			

Module 36

Code	Course/Module Title	ECTS	Semester
NVEEBM312	Physiology II	3	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	27
Description			
Cardiovascular system, action potential, functional design of cardiovascular system, electrophysiology of the heart ECG, cardiac cycle, cardiac output, blood pressure, muscle and nerve, excitable tissue, nervous tissue, types of nerves, excitation of the muscle, theories of contraction, muscle contraction changes, fatigue, smooth muscle, cardiac muscle, neuromuscular transmission, autonomic nervous system, anatomical consideration and autonomic reflex arch, sympathetic and parasympathetic nervous system, higher autonomic centers and neurotransmitters in autonomic nervous system, Micturition, Introduction to special senses, hearing, vestibular apparatus, vision and the eye muscle contractility, electroencephalography, biophysics of circulation, renal physiology, respiratory physiology.			

Module 37

Code	Course/Module Title	ECTS	Semester
NVEE213	Analogue Control	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			
Dynamic systems (electronic, communications), system representations (feedback paths, transfer functions, matrix representations of canonical forms), controllability, observability, system performance criteria (rise time, overshoot, delay time, settling time), steady state errors, root locus, Nyquist plots, controller and observer design, gain and phase margin, lead and lag compensators.			

Module 38

Code	Course/Module Title	ECTS	Semester
NVEEBM402	Biomaterials I	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			
Introduction of Biomaterials, History of Biomaterials, Fields of Knowledge to Develop Biomaterials, Uses of Biomaterials, Selection of Biomedical Materials, Materials Evaluation (Polymers, Metals, Composite Materials, Ceramics), Biodegradable Materials, Subjects are Important to Biomaterials Science, Properties of Biomaterials, Mechanical properties of Biomaterials, Thermal properties, Chemical properties, Bio ceramics, Polymer as Biomaterial, Metals and Alloys.			

Module 39

Code	Course/Module Title	ECTS	Semester
NVEEBM403	Medical Instrumentation	6	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1/1	78	72

Description
Introduction to bioinstrumentation system, bioinstrumentation system design, examples, medical laboratory instruments: colorimeter, spectrophotometer, PH meter, HB meter, blood gas meter, electromyography (EMG) system: EMG signal definition, EMG block diagram, EMG types, myoelectric potential measurement, EMG interference and noise source, EMG applications, the stimulation unit, stimulus isolation, stimulation circuit, conduction velocity and types, electrocardiography (ECG) system: ECG waveforms, ECG lead system, typical ECG machine, ECG system faults, electroencephalography (EEG) system: EEG signal definition, EEG block diagram, 10/20 electrode system, montage, EEG recording modes, EEG test conditions, EEG activity types, EEG application, EEG system faults, visual and auditory evoked potential recordings, telemetry EEG system, electroretinograph (ERG) system: ERG signal definition, ERG block diagram, procedure of the measurement, ERG faults, electrooccalograph (EOG) system, respiratory instrumentation system: impedance pnemography system, spirometry system, blood pressure and blood flow measurement systems, electrosurgery machine: electrosurgery circuits, unipolar and bipolar techniques.

Module 40

Code	Course/Module Title	ECTS	Semester
NVEEBM404	Modern Imaging Equipment I	6	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
X-Ray Equipment: X-ray definition, theory and production, Design of X-ray tube, X-ray power supplies and circuits, Heat loading characteristics of X-ray tube, X-ray control unit, X-ray switches and timing model, Development of X-ray films (automatic and manual), X-ray fluoroscope machine, Computed Tomography (CT scan): Introduction, data-Acquisition geometries, x-ray system of the CT, data acquisition system, computer system, Typical faults and maintenance.			

Module 41

Code	Course/Module Title	ECTS	Semester
NVEEBM405	Pathology	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			

Introduction to the cell biology, Types of tissues; Epithelial tissue, characteristic features of epithelial cells, glandular epithelia, Cell junction, Connective tissue; Cells &matrix .Types of connective tissue: Cartilage, Bone & Muscular tissue. Circulatory System(cardiovascular system):Heart &blood vessels. Respiratory System: components, lining Epithelium and the structure of the wall of the Respiratory portion &conduction portion. O2 exchange & the Pleura. Urinary System: , the kidney, nephrons: types .blood supply of the kidney. Renal corpuscles& tubules. Juxtaglomerular apparatus, Urinary bladder, Ureters& Urethra.The Digestive System: general structure of the digestive tract. Esophagus. Stomach.Small Intestine. Large Intestine (colon). Rectum, Pancreas &Liver. Biliary tract &Gall bladder. The Integument (The Skin). Nervous tissue, Pagets disease, causes. pathogenesis, investigations & diagnosis. Hyperparathyroidism. Calcium homeostasis. Fibrous dysplasia of bone, Calcium homeostasis. Fibrous dysplasia of bone. A vascular bone necrosis. . Subperiosteal haematoma , infections of bones. acute osteomyelitis. Tuberculosis of bones & joints. Bone fractures; types causes& symptoms. Bone fracture physiology. Bone healing, Factors influencing healing of fractures &complications. Pathological fracture. Osteoarthritis Immuno-pathological joint diseases; Rheumatoid arthritis. Systemic Lupus Erythematosus. Acute Rheumatic Fever . Systemic Sclerosis. Gout& Gouty arthritis. Pseudogout .Turner s syndrome Intervertebral disc disease. Bone tumors: types, causes, diagnosis, staging Cytogenetic&Karyotyping.Frozen sections, electron microscopy, Flocytometer, Immunoflorescence, Immunohistochemistry& Polymerase chain reaction, Cell injury, Necrosis. Radiation& cell damage. Inflammation, Acute inflammation types, changes &sequels. Chronic inflammation, ulceration, the sinus ,fistula ,cellulitis. Systemic effects of inflammation. Repair in chronic inflammation. Wound Healing &Repair. Hemodynamic disorders, Hemostasis, Thrombosis, Embolism, Infarction, Edema, Hyperemia &Congestion. Arterial diseases, Atheroma, Aneurysms. Heart& cardiac function Heart failure, Ischaemic heart disease, Heart failure, Angina Pectoris .Valvular heart disease. Respiratory system disorders; Inflammation of upper respiratory tract, Acute inflammation&& special types ,Chronic inflammation. Acute& Chronic Bronchitis, Emphysema,. Pneumonia, Bronchopneumonia ,Lobar-pneumonia Tuberculosis & Neoplasia.

Module 42

Code	Course/Module Title	ECTS	Semester
NVEE222	Communications Principles	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1/1	63	37
Description			
Transmissions Lines Equations; Transmission Bandwidth Concept; Distortion less Transmission Conditions; Types of Transmission Media. Amplitude Modulation; DSB; SSB; VSB Transmission; Amplitude Modulators; Balanced Modulator; Envelope Detectors. Angle Modulation; Spectrum Calculation for Sinusoidal Waveform; Phase Modulation; Relationship Between FM and PM; NBFM and WBFM; Frequency Modulators (Armstrong method)			

Module 43

Code	Course/Module Title	ECTS	Semester
NVEE214	Digital Control	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			

Automatic control is the science that develops techniques to steer, guide, control dynamic systems. These systems are built by humans and must perform a specific task. Examples of such dynamic systems are found in biology, physics, robotics, finance, etc. Digital Control means that the control laws are implemented in a digital device, such as a microcontroller or a microprocessor. Such devices are light, fast and economical. The use of digital computers in the control systems yields the following advantages over analog control systems:

- Reduced cost.
- Flexibility in response to design changes.
- Noise immunity.
- Digital control systems are more suitable for Modern control systems.

The digital computer (or micro-Controller, microprocessor) receives the error or only the reference signal and performs calculations (program) in order to improve the tracking performance for complex systems.
The points that will be examined in these lecture notes are the following:

- Transformation of an already designed continuous-time controller into a discrete-time controller.
- Discretization of continuous systems.
- Direct synthesis of discrete-time control systems.
- Practical considerations and precautions when implementing a digital controller.

Module 44

Code	Course/Module Title	ECTS	Semester
NVEEBM408	Biomaterials II	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			

Mechanical Behavior of Metals, Alloys and Thermal Equilibrium Diagrams, Corrosion and Wear inside the Human Body, Bio-Compatibility of Materials and Human Body, Decay inside and outside the Human Body, Corrosion and Wear inside the Human Body, Comparison between the Various Types of Wear and the Environmental Effects, Hard Tissue Replacements, Composite Biomaterials, Nanotechnology.

Module 45

Code	Course/Module Title	ECTS	Semester
NVEEBM409	Therapeutic Instrumentation	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	72
Description			
Physiotherapy Devices, Wax Bath Device, Infrared (IR), Ultraviolet (UV) and Ultrasonic Therapeutic devices, Microwaves and Short Waves Devices, Electrotherapy, Electrical Stimulation for Pain Relief, Lithotripsy, Extra-Corporeal Shock Wave Lithotripter, Artificial Pulmonary Ventilators, Medical Gases, Oxygen Therapy, Ventilators Classification, Pressure-Volume-Flow Diagrams, Anesthesia Machine, Cardiac Defibrillators, Cardio version, Cardio tachometer, Tooth Chair (Dental Unit), Pneumatic and Hydraulic Circuits.			

Module 46

Code	Course/Module Title	ECTS	Semester
NVEEBM410	Modern Imaging Equipment II	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
Nuclear Medicine and Magnetic Resonance Imaging Systems: the hardware, magnet types, RF coils, magnetization, Radioisotopes in Medical Diagnosis, Physics of Radioactivity, Principles of NMR Imaging			

System, Image Reconstruction Techniques, Basic MRI Components, Biological Effects of NMR Imaging, Gamma Camera.

Module 47

Code	Course/Module Title	ECTS	Semester
NVEEBM411	Thermo-Fluid Mechanics	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			
Properties and Units, Fluid Static, Pressure Head, Fluid Flow, Flow Patterns, Newton's Law of Viscosity, Continuity Equation, Energies Relationships Bernoulli Equation, Reynolds Number Friction Factor, Pressure Drop in Pipes and Fittings, Pumps, Flow measurement, Boundary layer, Heat Transfer, Conduction, Convection, Radiation, Heat Exchangers, Refrigeration, drugs delivery: controlled release. Mixture of gases, non-Newtonian fluids, Extraction, Filtration, Membrane Processes, Diffusion, Freeze Drying, Adsorption, Absorption, Flow through porous media, refrigeration.			

Module 48

Code	Course/Module Title	ECTS	Semester
NVEEBM412	Digital Communications	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1/1	63	37
Description			
The differences between digital and analog sources and systems and the advantages and disadvantages of digital communications are explored. Signal types and sampling theory are also introduced. Equations and waveforms in the time domain are studied, along with generation and detection circuits. The required channel bandwidth for various modulation techniques such as PAM, PTM, PWM, and PPM is discussed. Time-division multiplexing (TDM) for sampled signals is covered, and a tutorial is provided. Pulse code modulation (PCM) is explored, including equations, waveforms, generation, and detection circuits. Signal-to-noise ratio (S/N) and required channel bandwidth are also addressed. Compression-expansion techniques and line coding for baseband signals are introduced, along with TDM-PCM. Delta modulation (DM) is studied, including equations, waveforms, generation, and detection circuits. Signal-to-noise ratio, required channel bandwidth, and adaptive delta modulation (ADM) are covered. Power spectral density (PSD) and the probability of error for baseband signals are introduced. Finally focus on			

different digital carrier modulation techniques, such as ASK, FSK, PSK, QPSK, DPSK, and QAM. Equations, waveforms, generation and detection circuits, constellation diagrams, power spectral density, required channel bandwidth, and probability of error are discussed for each technique.

Module 49

Code	Course/Module Title	ECTS	Semester
NVEEBM501	Diagnostic Instrumentation	6	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
Medical Ultrasound, Basic Modes of Transmission of Ultrasound, Pulsed and Continuous, Doppler Ultrasound, Doppler Blood Flow meter, Blood Pressure Measurement by Ultrasound. Ultrasound Imaging Mode Systems, Multi element Transducer, Echocardiography, Echoencephalography, Endoscopy, Types of Endoscopes, Capsule Endoscopes, Patient Alarm Systems, Types of Alarm Circuits, Lead faults indicator, Patient Monitoring Systems, Medical Oscilloscopes, Types of Scopes, Multi beam scopes, Storage Oscilloscope, Monitoring Hardware and certain Circuits			

Module 50

Code	Course/Module Title	ECTS	Semester
NVEEBM502	Digital Image Processing	6	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	72
Description			
Introduction, Image Processing Fundamentals, Image Processing Fundamentals, Image Enhancement (Point Processing), Image Enhancement (Histogram Processing), Spatial Filtering, Frequency Filtering, Image restoration, Wavelets and Multiresolution Processing, Segmentation			

Module 51

Code	Course/Module Title	ECTS	Semester

NVEEBM503	Medical Optics & Fiber	5	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	77
Description			
Introduction, Basic Optics and Optical System Specifications, Gaussian Optics, The Cardinal Points. Paraxial Optics and Calculations. Optical System Considerations, Prism and Mirror Systems, Characteristics of the Human Eye. Optical Materials, Glass Selection (Including Plastics), Optical Coatings, Principles of Radiometry and Photometry. Lens Design for Eyepieces, Microscopes, and Design of Illumination Systems, Design Optical Sensor Systems Modeling and Analysis. The Practice of Optical Engineering, Optical Manufacture, Materials, Rough shaping, Blocking, Grinding, Polishing, Centering, High-speed processing. Lasers, Optical fiber.			

Module 52

Code	**Course/Module Title**	**ECTS**	**Semester**
NVEEBM504	Computer Network for Medical Application I	5	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
Introduction to the computer network, network model (LAN, MAN, WAN), Network topology, and transmission media. Data link layer, Data Link Control (DLC), and Media Access Control (MAC). Ethernet. Introduction to the Network layer, IP address, subnetting, and IP forwarding			

Module 53

Code	**Course/Module Title**	**ECTS**	**Semester**

NVEEBM505	Biomechanics I	5	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1/1	63	62
Description			
Introduction, kinematics concepts for analyzing human motion, kinetics concepts for analyzing human motion, the biomechanics of human bone and development, the biomechanics of human skeletal articulations, the biomechanics of human skeletal muscle, the biomechanics of human upper and lower extremities, the biomechanics of human spine			

Module 54

Code	**Course/Module Title**	**ECTS**	**Semester**
NVEE211	Design of graduation project	3	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
0	2	33	42
Description			
Collaborative team work of the nature in a research environment is expected, including extensive interaction with other students. Each student should submit a written technical report and should attend the final oral examination. The students apply verbal written and oral technical skills to document the design process.			

Module 55

Code	**Course/Module Title**	**ECTS**	**Semester**
NVEEBM507	Image Processing for BME	6	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1/1	78	72
Description			
Digital image processing is used for two distinct purposes:			

- Improving the appearance of the image so that it is easier for an observer to interpret
- Digitally analyzing the image for the purpose of describing, identifying and interpreting the content of an image.
- The course will present the basic algorithms and methodologies for both purposes in the field of space and in the field of frequencies.

Module 56

Code	Course/Module Title	ECTS	Semester
NVEEBM508	Biomechanics I I	5	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1/1	63	62
Description			
Linear kinematics of human movement, angular kinematics of human movement, linear kinetics of human movement, equilibrium and human movement, angular kinetics of human movement, human movement in a fluid medium, human body center of gravity.			

Module 57

Code	Course/Module Title	ECTS	Semester
NVEEBM509	Computer Network for Medical Application II	5	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1/1	63	62
Description			
IPv4, IPv6, VLAN, Wireless LAN. Spanning Tree protocol. The routing protocol (Distance vector, Link state, RIP, OSPF, and BGP4). Introduction to Transport Layer. Transport Layer protocol (UDP and TCP). Cloud Networking, Internet of Things (IoT).			

Module 58

Code	Course/Module Title	ECTS	Semester
NVEEBM510	Robotics in Medicine	5	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			
In this course the student will learn the basics of robotics, direct and inverse kinematics, and motion and vision planning. Also Design, build, prepare and program robots systems for medical applications and create smart machines that can help humans through Human-machine interfaces			

Module 59

Code	Course/Module Title	ECTS	Semester
NVEEBM511	Neural Networks & AI	5	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2/1	78	47
Description			
Artificial Intelligent (AI), machine learning (ML), deep learning (DL), artificial neural network (ANN), activation functions, classification, regression, clustering, learning methods, supervised learning, unsupervised learning, reinforcement learning, model overfitting, model under fitting, Gradient descent, bias, variance, Naïve Bayes classifier, genetic algorithms, traveling salesman problem (TCP), route-finding searching algorithms, fuzzy logic, pattern recognition, face detection, face recognition.			

Module 60

Code	Course/Module Title	ECTS	Semester
NVEE212	Implementation of graduation project	4	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**

-	4	62	38

Description

The BSc Systems and Biomedical Engineer program provides undergraduate students with the chance to select a project from a range of options within the control department. This allows them to engage in research and enhance their skills in line with fundamental engineering principles and design. Students will undertake a substantial project that necessitates the utilization of professional competencies such as project planning, risk assessment, and management. Presenting a final project report and delivering a presentation will enable students to apply critical analysis, thorough research, and enhance their communication abilities.

- Prepare for a comprehensive literature review that can plan for an appropriate project for a certain group to add new knowledge
- Attempt to find an engineering problem or industry problem and use a blend of theoretical plus practical skills and knowledge to solve it.

Contact

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المواد الدراسية للمرحلة الأولى/الفصل الاول

Module Description of Mathematics I

وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Mathematics I			**Module Delivery**	
Module Type	Core			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEE206				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	UGI		**Semester of Delivery**	1	
Administering Department	Dept. of Biomedical Engineering- BME		**College**	College of Electronics Engineering- EE	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	Jun 01, 2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop problem-solving skills. 2. To use analytical methods to solve related problems. 3. To understand the basics of linear algebra and its applications.

	4. To review previous knowledge of differentiation and gain new knowledge with new applications of differentiation. 5. To understand logarithmic functions along with their properties, graphs, and derivatives. 6. To tackle exponential functions along with their properties, graphs, and derivatives. 7. Understanding further transcendental functions. 8. The course primarily emphasizes the basics of linear algebra and calculus.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To explore the concept of Linear Algebra. 2. Perform matrix addition and multiplication, and identify special matrices. 3. Define and understand the Rank of a Matrix. 4. Describe a system of linear algebraic equations, and solving systems of equations with row operations and augmented matrix (Gaussian Elimination method, Gauss-Jordan elimination method). 5. Finding the inverse of a 2X2 and 3X3 matrices, and using it to solve systems of equations. 6. Understand the concept of trivial and non-trivial solutions. 7. Find the matrix determinant. 8. Apply Cramer's rule to solve systems of equations. 9. Define the Eigen Value and Eigen Vector Problem. 10. Determine the Eigen values and vectors of a given Matrix. 11. Apply differentiation techniques, also, discuss implicit differentiation, higher order differentiation, and applications of differentiation including maxima and minima, and curve plotting. 12. To familiarize oneself with Transcendental functions (e.g., Exponential functions, Natural logarithm functions, Logarithmic functions to an arbitrary base, Trigonometric functions, Inverse trigonometric functions, Hyperbolic functions, and Inverse hyperbolic functions) along with their properties, and graphs. 13. Compute derivatives of transcendental functions (e.g., Exponential functions, Natural logarithm functions, Logarithmic functions to an arbitrary base, Trigonometric functions, Inverse trigonometric functions, Hyperbolic functions, and Inverse hyperbolic functions). 14. To become familiar with Vectors and Representation of vectors in space (i;j;k), dot and cross products, vector functions, partial derivatives, directional derivatives, Gradient, Del operator, Divergence, and Curl.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Basics of Linear Algebra: Matrices properties, special matrices, elementary row operations, and solving systems of equations using various techniques. Differentiation techniques, Chain rule, Implicit differentiation; Higher order differentiation; Applications of differentiation, maxima, and minima; Curve plotting, Differentiation of trigonometric functions, etc. Transcendental functions (e.g., Exponential functions, Natural logarithm functions, Logarithmic function to an arbitrary base, Trigonometric functions, Inverse trigonometric functions, Hyperbolic functions, and Inverse hyperbolic functions) along with their properties, and graphs.

	Differentiation of transcendental functions (e.g., Exponential functions, Natural logarithm functions, Logarithmic functions to an arbitrary base, Trigonometric functions, Inverse trigonometric functions). Vectors and Representation of vectors in space (i;j;k), dot and cross products. Integration: The Fundamental Theorem of Calculus, The Definite Integral & The Indefinite Integral, Integration of Transcendental functions & Algebraic Substitutions

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy is to enhance the fundamental mathematical abilities of engineering students, which are essential for comprehending engineering disciplines efficiently. The topics covered in this course will serve as fundamental building blocks, enabling students to pursue specialized studies in various engineering and technological domains.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	15% (15)	6, 9, 11	LO #1, 3, 4, 7, and 13
	Assignments	2	15% (15)	2, 12	LO # 2, 5, 6 and 11
	Projects / Lab.	-	-	-	-
	Report	1	10% (10)	-	-
Summative assessment	**Midterm Exam**	3 hrs	10% (10)	8	LO # 1-9
	Final Exam	3 hrs	50% (50)	16	All

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	**Matrices:** - Matrix Algebra (Column and Row Vectors, Matrix Addition, Matrix Multiplication, Scalar Multiple of a Matrix, Transpose of a Matrix). - Rank of a Matrix. - Special Matrices. - Systems of Linear Algebraic equations.
Week 2	- Elementary Row Operations and Elimination methods. - Gaussian Elimination method. - Gauss-Jordan elimination method. - Linear Independence/Dependence.
Week 3	- Matrix Inverse. - Solving Systems of Linear Equations using Matrix Inverse. - Trivial and Non-trivial solutions. - Determinants and their properties. - Cramer's rule.
Week 4	**Differentiation:** - Tangents and the Derivative at a Point. - The Derivative as a Function. - Differentiation Rules.
Week 5	- The Derivative as a Rate of Change. - Derivatives of Trigonometric Functions. - The Chain Rule and Higher Order Derivatives.
Week 6	- Implicit Differentiation. - Concavity (Maxima and minima). - Curve sketching. - Indeterminate Forms and L'Hôpital's rule.
Week 7	Mid-term Exam
Week 8	**Transcendental functions:** - Exponential functions. - Logarithmic function to an arbitrary base.
Week 9	- Natural logarithm functions. - Inverse trigonometric functions.
Week 10	- Differentiation of Exponential, Logarithmic functions to an arbitrary base, and Natural logarithm functions.
Week 11	- Differentiation of Inverse trigonometric functions.
Week 12	**Vectors**: - Representation of vectors in 2D and in space (i;j;k). - Dot and cross products.
Week 13	**Integration:** - The Fundamental Theorem of Calculus. - The Definite Integral + The Indefinite Integral.
Week 14	- Integration of Transcendental functions.

Week 15	- Algebraic Substitutions
Week 16	Perpetration of Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Thomas's Calculus 12th edition	Yes
Recommended Texts	- Advanced Engineering Mathematics 6th edition by Dennis G. Zill - Engineering mathematics by o'neil, sixth edition	No
Websites	https://ocw.mit.edu/courses/18-06-linear-algebra-spring-2010/ , https://www.khanacademy.org/math/linear-algebra https://www.ohio.edu/mechanical-faculty/williams/html/PDF/MatricesLinearAlgebra.pdf	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM of Digital Techniques

نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Digital Techniques	**Module Delivery**	
Module Type	Basic learning activities	☒ **Theory**	
Module Code	NVEE217	☐ **Lecture**	
ECTS Credits	**5**	☒ **Lab**	
SWL (hr/sem)	**125**	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	

Module Level	UGI	**Semester of Delivery**	1
Administering Department	Dept. of Biomedical Engineering- BME	**College**	College of Electronics Engineering- EE
Module Leader		**e-mail**	
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	Jun 01, 2023	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Digital Technique is a subject that helps students to understand binary numbers and gives them good information about the most famous digital circuits that were used in every digital system.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1- Digital systems and Binary Numbers 2- Boolean Algebra and Logic Gate 3- Gate level minimization 4- Combinational Logic
Indicative Contents المحتويات الإرشادية	Boolean algebra and circuit design [15hrs] Logical analysis and Argumentation[20hrs] Applications of Logic [10hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing and Online testing.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1- #4
	Assignments	2	10% (10)	2 and 12	LO #1- #4
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #4
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1- #4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction Decimal number system; Binary; Octal and hexadecimal number systems; Conversion from one number to another number system; Addition; Subtraction; Multiplication and division using a different number system
Week 2	Representation of binary number insignia-magnitude; Sign 1's Complement and align 2's complement notation; Rules for addition and subtraction with complement Representation; BCD
Week 3	AND; OR; NOT; NAND; NOR; Ex-OR logic gates; Positive and negative logic; Fundamental concepts of Boolean algebra; De-murrage's laws; Principles of duality
Week 4	Simplification of Boolean expressions; Canonical and standard forms for Boolean function; SOP and POS forms; Realization of Boolean functions using only NAND and NOR gates
Week 5	Objectives of the minimization procedures; Karnaugh map method; The 3-Variable Karnaugh Map
Week 6	The 4-Variable Karnaugh Map; Karnaugh Map SOP Minimization
Week 7	Midterm exam+ Don't care conditions; Karnaugh Map POS Minimization; Converting Between POS and SOP Using the Karnaugh Map.
Week 8	Half adder and full adder. Half subtractor and full subtractor

Week 9	Binary Full Adder, Binary Subtractor , Binary Addition Subtraction and BCD Adder.
Week 10	BCD to 7-segment decoder; Common anode and common cathode 7-segment displays
Week 11	Parity generator and checker; Code converters; Majority circuits; magnitude comparator
Week 12	Encoder; priority encoder; decoder
Week 13	Multiplexer and demultiplexer circuits
Week 14	Implementation of Boolean functions using decoder and Multiplexer
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Exp. No. 1: Basic Logic Gates
Week 2	Lab 2: EXP NO.2: Simplification Using Boolean Algebra
Week 3	Lab 3: EXP NO.3: Adder and Subtractor Circuits, Comparator Circuit
Week 4	Lab 4: EXP NO.4: Encoding-Decoding
Week 5	Lab 5: EXP NO.5: 7-Segment Displaying
Week 6	Lab 6: EXP NO6: Multiplexers
Week 7	Lab 7: EXP NO7: DeMultiplexers

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1- DEGITAL DESIGN M.MORRIS MICHAEL D. CILETTI 2 – Digital Fundamentals FLOYD & JAIN	Yes
Recommended Texts	Logic and Computer Design Fundamentals | Fifth Edition Global Edition | by Morris Mano • Charles R. Kime • Tom Martin | Pearson Education 2016	Yes
Websites	https://www.javatpoint.com/digital-electronics	

Grading Scheme
مخطط الدرجات

Group	**Grade**	التقدير	**Marks %**	**Definition**

Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
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MODULE DESCRIPTION Form of Engineering Drawing

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Drawing			**Module Delivery**	
Module Type	Support or related			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	NVEE201				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	UGI		**Semester of Delivery**	1	
Administering Department	Dept. of Biomedical Engineering- BME		**College**	College of Electronics Engineering- EE	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	Jun 01, 2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	After completing this course module, the student must be able to: 1- Drawing engineering shapes manually and clearly, including the effective use of the computer-aided drawing program (AutoCAD). 2- Develop a solid understanding of the basic principles of engineering drawing, including the ability to work with concepts, analytically, and visualize them and a functional understanding of how these ideas will manifest in the real world. 3- Determine the strategies to be used and the assumptions to be made. 4- Use both manual and computer approaches in drawing figures. 5- Develop the ability to use engineering tools flexibly and creatively. 6- Define the terms related to computer-aided drafting systems in general and AutoCAD or specific. 7- Identify the important tools used to create technical drawings in CAD; 8- Create electronic drawings (e-drawing) using CAD; 9- Apply the usefulness of the knowledge and skills in computer-aided drafting as applied in his/her professional development. 10- Examine the utility of AutoCAD Electrical as a software solution for the creation and manipulation of schematic diagrams. 11- Applies knowledge of mathematics, science, and engineering, 12- 8. Design and conduct experiments, as well as analyze and interpret data
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand and apply the basics of drawing types of lines. 2- Define, explain and apply engineering drawing operations. 3- Engineering drawing operations, Projectile theory. 4- Drawing the three projects. 5- Dimensions 6- Find the missing project 7- Isometric. 8- Sections Using AutoCAD Interface: Students should become familiar with the AutoCAD user interface, including the various tools, menus, and commands available in the software. 9- Creating 2D Drawings: Learners should gain proficiency in creating accurate and detailed 2D drawings using AutoCAD. This includes drawing lines, circles, arcs, polygons, and other geometric shapes.

	10- Modifying and Editing Drawings: Students should be able to modify existing drawings by using AutoCAD's editing tools. This involves techniques such as scaling, stretching, rotating, mirroring, and trimming objects. 11- Working with Layers and Line-types: Participants should learn how to effectively use layers to organize and manage different elements of a drawing. They should also understand line-types and how to apply them to objects. 12- Adding Annotations and Dimensions: Learners should be able to add text annotations, labels, and dimensions to their drawings using AutoCAD's annotation tools. This includes adding dimensions, text, and leaders to convey information accurately. 13- Creating and Managing Blocks: Students should gain proficiency in creating reusable blocks in AutoCAD. This involves creating block definitions, inserting blocks into drawings, and modifying blocks when necessary. 14- Understanding 3D Concepts: Gain a clear understanding of fundamental 3D concepts, including coordinate systems, viewpoints, and 3D navigation techniques. 15- Creating Basic 3D Objects: Learn how to create basic 3D objects, such as cubes, spheres, cylinders, cones, and pyramids, using AutoCAD's 3D modeling tools. 16- Modifying 3D Objects: Develop the ability to modify 3D objects by moving, rotating, scaling, mirroring, or stretching them in 3D space to achieve the desired shape and position. 17- Performing Printing and Plotting: Participants should learn how to set up and configure layouts for printing and plotting drawings. They should understand the different print settings, paper sizes, and scales. 18- Glance to the basic electrical diagrams in AutoCAD Electrical
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A Introduction to engineering drawing</u> 1- Engineering drawing tools. 2- Kind of lines, arcs, Arabic and English engineering letters. 3- Engineering drawing operations 4- Projectile theory. 5- Drawing the three projects. 6- Dimensions 7- Find the missing project 8- Isometric. <u>Part B– 2D Drawing</u>

	1- Drawing Area: The drawing area is where the actual geometry and objects are created. 2- Lines and Polylines: Lines and polylines are fundamental objects used to represent edges, outlines, and boundaries of various components in the drawing. They can be straight or curved, and they form the basis for creating other geometric shapes. 3- Circles and Arcs: 4- Layers: Layers are used to organize and control the visibility of different elements in the drawing. 5- Text: Text is used to add annotations, labels, and other textual information to the drawing 6- Dimensions: AutoCAD offers various dimensioning tools to add accurate measurements to the drawing. Linear dimensions, angular dimensions, and radial dimensions can be added to specify distances, angles, and sizes of objects. 7- Blocks and Symbols: Blocks are pre-defined groups of objects that can be reused multiple times in a drawing. They are often used to represent standard components or symbols. AutoCAD allows users to create custom blocks or use existing libraries of blocks and symbols. 8- Plotting and Printing: AutoCAD provides tools for plotting and printing the final drawing. This includes specifying the paper size, scale, print area, and setting up the plot style to control line weights and colors when generating physical or digital outputs. <u>Part C – 3D Drawing</u> Introduction to 3D Modeling, Navigating the 3D workspace in AutoCAD Creating basic 3D geometric shapes (cubes, spheres, cylinders) , Editing and modifying basic 3D objects , Applying basic transformations (move, rotate, scale) to 3D objects Advanced 3D Objects, Using viewports to control multiple views of a 3D model Controlling perspective and orthographic views, Understanding and utilizing the 3D navigation tools <u>Part D – AutoCAD Electrical</u> Introduction to workspace and main difference in panels Create simple projects inside AutoCAD Electrical [**<u>6 hr.</u>**]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• Hands-On Practice: Provide ample opportunities for students to practice using AutoCAD through hands-on exercises and projects. • Visual Aids and Examples: Utilize visual aids, such as slides, diagrams, and video tutorials, to complement your explanations and make complex concepts more understandable. Provide examples and showcase real-world applications of AutoCAD to demonstrate its relevance and inspire students. • Resources and References: Provide students with additional resources, such as textbooks, online tutorials, and reference guides, to support their learning outside the classroom. Recommend reputable websites, forums, and communities where they can seek further assistance and expand their knowledge. Continuous Learning: Encourage students to continue learning AutoCAD beyond the classroom. Highlight the importance of staying up-to-date with new features, tools, and techniques by exploring online resources, attending webinars, or participating in AutoCAD user communities.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	40	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	6	20% (20)	5 and 10	LO #1, 2, 10 and 11
	Assignments	3	10% (10)	2 and 12	LO # 3, 4, 6 and 7
	Projects / Lab.	3	10% (10)	Continuous	All
	Report	0	0% (0)	0	
	Midterm Exam	2hr	10% (10)	7	LO # 1-7

Summative assessment	**Final Exam**	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Introduction to engineering drawing** ● Introduction and introducing students to the subject of engineering drawing, which includes identification of engineering tools and how to use them. ● Engineering drawing tools
Week 2	● Kind of lines, arcs, Arabic and English engineering letters. ● Teach students how to apply and draw the following engineering operations: ● Drawing a straight line parallel to a known straight line, the division of the rectum into two halves, angle division, and drawing a straight line parallel to a known straight line.
Week 3	• Multi-view projection • Perpendicular Projection Theory of Objects: • Types of projection in drawing and their practical importance • Types of projections resulting from vertical projection and approved in the projection of various engineering objects:Front view, Side view, Top view
Week 4	• **Introduction to CAD , Introduction to AutoCAD**
Week 5	**AutoCAD Fundamentals** • Screen layout • Have a brief look at the AutoCAD Toolbars • Opening existing Drawing files • Saving your works
Week 6	**Basics of Drawing or drafting (2D) in AutoCAD** • Preparing the area of drawing • Drawing Lines • Polyline • Polygons • Circle drawing methods • View Port Tools
Week 7	**Mid-term Exam**
Week 8	• Two practical examples for practicing on AutoCAD Interface and coordinate systems
Week 9	**2D- Modify Commands** Using the following Commands: • Move, Copy, Rotate, Mirror • Trim, fillets, offset

	• Scale, Array
Week 10	Two practical examples for practicing on AutoCAD Modify Tools
Week 11	**Annotation and Layers** • Multiline Texts • Create linear dimensions • Layer Properties • Create a group of objects • Two practical examples for practicing on Dimensions and layers for two different figures
Week 12	• Review on 2D- drafting with answering questions for students
Week 13	**Basics of 3D in AutoCAD-Part 1** • Why use 3D drawing • Introduction to Orthographic Projection and Isometric • Switching to 3D- Modelling workspace in AutoCAD
Week 14	**Basics of 3D in AutoCAD-Part 2** • Introduction to the Modelling commands (Basics) (Extrude, Press Poll, and Solid Editing Tools) • One practical example of practicing on 3D figures and Solid editing • Two different multi-view projections tutorials
Week 15	**Glance to AutoCAD Electrical** • Introduction to AutoCAD electrical and how to use wire panel • Create projects and dealing with templates based on IEC standards for Control Engineers
Week 16	**The preparatory week before the Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	150 CAD Exercises Book by Sachidanand JHA	NO
Recommended Texts	1- Fundamentals of Engineering Drawing - أساسيات الرسم الهندسي By : Ahmed Nidham Mohammed, Publisher: Dar Al-Waddah For Publishing & Distribution - Amman – Jordan, ISBN: 9789923190906 2. Fundamentals of AutoCAD 2020 - اساسيات اوتوكاد By : Ahmed Nidham Mohammed ● Edition: First	Available online

	• Publisher: Dar Al-Waddah For Publishing & Distribution - Amman - Jordan • ISBN: 9789923190418	
Websites	https://autocadfiles.com/, https://www.youtube.com/c/CADCAMTUTORIAL, https://www.computeraideddesignguide.com/	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
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	C - Good	جيد	70 - 79	Sound work with notable errors
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MODULE DESCRIPTION Form of Chemistry

وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Chemistry			**Module Delivery**	
Module Type	Support or related			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEEBM105				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	UGI		**Semester of Delivery**	1	
Administering Department	Dept. of Biomedical Engineering- BME		**College**	College of Electronics Engineering- EE	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	Jun 01, 2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student will be able : 1. To understands the concept of occupational safety, especially when working in hospitals and medical laboratories, through his understanding of warning signs and methods of prevention from the dangers resulting from the use of chemicals. 2. To learn about glassware and laboratory equipment and how to deal with them 3. Clarification and measurement of some properties of chemicals such as boiling and melting points and other properties 4. To learn how to prepare, measure and calculate standard solutions, and determine concentration by titration. 5. To learn basic concepts of separation, chemical subjects and some technical methods related with biomedical engineering. 6. Learn about the concept of acidity and alkalinity, the method of measuring them, and Buffer molecules and systems (blood, lungs, and kidneys) in the human body. 7. Recognizing the role of some types of chemistry, such as nuclear chemistry, in treatment and diagnosis. 8. Knowing the applications of pressure laws and their impact on the chemo physiological processes in the human body, such as breathing processes (inhalation and exhalation). 9. Learn the steps to achieve balance for the organism, especially the human being, and how to maintain the homeostasis of human body. 10. To know about human blood and its component and understand about 3 separation serum or plasma from hole blood. 11. To recognize the main chemical molecule (carbohydrate, proteins and lipids) in human body and the relationship among them to understand normal and abnormal cases that related to metabolism. 12. To recognize other important chemical molecule(Hormones, enzymes, vitamins and minerals), and clarify its role in the body and its impact on the various vital processes in the human body
Indicative Contents المحتويات الإرشادية	Indicative content includes the following:- Part A – General chemistry Solutions, solution terminology (solubility, factor influencing solubility, saturated solutions, unsaturated solutions, supersaturated solutions) [4 hrs.] , dilutions, isotonic solutions, aqueous solutions, ionic solutions, electrolytes and non-electrolytes. [5 hrs.] osmosis and osmotic pressure, colloids, emulsifying agents dialysis and living systems [4 hrs.]

	Acids& Bases, measuring pH, acid- base titration, buffer solutions, blood buffers and buffering capacity in blood. [4 hrs.] Nuclear chemistry , Isotopes, Radioactivity, type of radiation, properties of Alpha, Beta and Gamma radiation, Ionizing radiation, Units, detection devices, physiological effects of radiation, radioactive decay series, nuclear reactions, half – life, uses of radioisotopes(especially in medicine). [4 hrs.] Gases, Ideal gas laws, Boyle, s low, Charle, s low , Gay- Lussac, s low, The combined gas low, and Dalton, s low, Gas low and breathing, the combined gas low, and Dalton, s low, Gas low and breathing [4 hrs.] Part B – Biochemistry Introduction, metabolism (anabolism and catabolism), homeostasis, [4 hrs.] Blood [4 hrs.]. Carbohydrates (definitions, functional group, characteristics, reactions) [8 hrs.] Proteins (definitions, functional group, characteristics, reactions) [4 hrs.] Lipid (definitions, functional group, characteristics, reactions). [2 hrs.] Lipid profile, Body mass index (BMI). [4 hrs.] Interpretation of metabolism (pathways of metabolism, disease due to error in metabolism) [12 hrs.] Hormones, enzymes, vitamins and minerals. [12 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing and Online testing.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	15%(15)	2,5,6,11,12	LO # 1,2,4,6,7,8 ,10 and 11
	Assignments	1	10%(10)		
	Projects / Lab.	-			
	Report	1	15%(15)	13	LO # 1,2,3,4,5,and 11
Summative assessment	Midterm Exam	3 hrs.	10%(10)	7	LO # 1-7
	Final Exam	3 hrs.	50%(50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Solutions, solution terminology (solubility, factor influencing solubility, saturated solutions, unsaturated solutions, supersaturated solutions)
Week 2	Dilutions, isotonic solutions, aqueous solutions, ionic solutions, electrolytes and non-electrolytes.
Week 3	Osmosis and osmotic pressure, colloids, emulsifying agents dialysis and living systems
Week 4	Acids& Bases, measuring pH, acid- base titration, buffer solutions, blood buffers and buffering capacity in blood.
Week 5	Nuclear chemistry , Isotopes, Radioactivity, type of radiation, properties of Alpha, Beta and Gamma radiation, Ionizing radiation, Units, detection devices, physiological effects of radiation, radioactive decay series, nuclear reactions, half – life, uses of radioisotopes(especially in medicine).
Week 6	Gases, Ideal gas laws, Boyle, s low, Charle,s low , Gay- Lussac, s low, The combined gas low, and Dalton,s low, Gas low and breathing, the combined gas low, and Dalton, s low, Gas low and breathing
Week 7	Introduction, metabolism (anabolism and catabolism), homeostasis.
Week 8	Blood
Week 9	Carbohydrates (definitions, functional group, characteristics, reactions).
Week 10	Proteins (definitions, functional group, characteristics, reactions).
Week 11	Lipid (definitions, functional group, characteristics, reactions). Lipid profile, Body mass index (BMI).

Week 12	Interpretation of metabolism (pathways of metabolism, disease due to error in metabolism) PART I
Week 13	Interpretation of metabolism (pathways of metabolism, disease due to error in metabolism) PART II
Week 14	Hormones
Week 15	Enzymes, ,Vitamins and minerals.
Week 16	The preparatory **week before the** Final **Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Lippincott' s lllustrated Reviews by Richard A. Harvey , 5th edition, 2011. The chemical basis of life, by George H. Schmid, ph.D, Little, Brown and company Boston 1982.	YES
Recommended Texts	Handbook of chemistry and physics, by Holden,N. E., 2000 . Clinical Biochemistry and metabolic medicine by Martin Andrew Crook, 2012	No
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEEBM11				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Maha Abdulla Mohammed		**e-mail**	Maha.abdullah@uoninevah.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name		None	**e-mail**	None	
Scientific Committee Approval Date		20/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The aim of the module is to enhance language skills and develop critical thinking and to enable students to be familiar with the basics of the English Language in general such as grammatical forms and structure, new vocabularies, reading, and speaking inside the class. This will help students to master the language by knowing the basics and the essential pillars of the language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students are expected to be able to: 1. learn new vocabulary. 2. try to speak inside the class in groups. 3. learn grammatical structures as this will be an outlet for them to learn English more in the future. 4. Ability to write simple paragraphs. 5. It will also focus on verbal communication.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Basics of Grammar Parts of speech and use of articles Sentence structure, Active and passive voice Practice in a unified sentence Analysis of phrase, clause, and sentence structure Transitive and intransitive verbs Punctuation and spelling Comprehension Answers to questions on a given text Discussion General topics and everyday conversation (topics for discussion to be at the discretion of the teacher keeping in view the level of students) Listening To be improved by showing documentaries/films carefully selected by subject teachers) Translation skills Arabic to English Paragraph writing
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The strategy is to make the students speak in the classroom and read the conversations, do assignments, and work in groups. The focus will also be on their listening, reading, and speaking skills by practicing from the texts and using slide shows where needed.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	UNIT ONE An Introduction to Biomedical Engineering
Week 2	FIRSTS AND LASTS Past simple – positive and negative Past simple – questions
Week 3	UNIT TWO Robotics Biomedical and Health Care Engineering
Week 4	**Self- Assessment** (Units 1-2) and Quiz
Week 5	Unit Three Tissue Engineering

Week 6	Unit Four Medical Imaging
Week 7	Mid-term Exam
Week 8	Unit Fife Nanotechnology in Biomedical Engineering
Week 9	Unit Six Rehabilitation Engineering
Week 10	Self-assessment (Units 5-6) and Quiz
Week 11	Unit Seven Biomaterials
Week 12	Unit Eight Genetic Engineering
Week 13	Self- Assessment (Units 7-8) and Quiz
Week 14	Weak forms of prepositions, Vowel sounds, and silent letters, Stress on content words in questions
Week 15	**Review**
Week 16	**Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Cutting Edge (Third Addition)	Yes
Recommended Texts		No
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	DC Circuit Analysis			**Module Delivery**	
Module Type	Core			☒ **Theory**	
Module Code	NVEE215			☐**ecture**	
ECTS Credits	7			☒ **Lab**	
TWL (hr/sem)	175			☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	1		**Semester of Delivery**	1	
Administering Department	All Departments		**College**	College of Electronics Engineering- EE	
Module Leader	Dia M. Ali		**e-mail**	Dia.ali@uoninevah.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Semaa K. Nafea		**e-mail**	Semaa.nafea@uoninevah.edu.iq	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	

Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To Apply Kirchhoff's current and voltage Laws . 6. To perform mesh and Nodal and Mesh analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Describe electrical power, charge, and current. 5. Identify the basic circuit elements and their applications. 6. Define Ohm's law. 7. Explain Series and parallel connection 8. Explain the two Kirchoff's laws used in circuit analysis. 9. Apply Mesh and Nodal analysis for circuits analysis. 10. Apply superposition for circuit analysis. 11. Using Thevenin and Norton equivalent circuits for handy analysis techniques.
Indicative Contents	Indicative content includes the following.

المحتويات الإرشادية	Part A – BASIC CONCEPTS: Voltage & current; Power & Energy; Dependent and Independent sources; Ohm's laws series & parallel connections; Delta- star connections and transformations. [15 hrs] Part B - D.C. Network Theorems: Source transformation; Linearity & superposition; Thevenin's & Norton's Theorems; Source transportation; source superposition; Nodal analysis; Mesh analysis. [35 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	85	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.7

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, to #6 #8 to #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	5% (10)	Continuous	All
	Report/lab.	7	15% (10)	Continuous	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #8
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Voltage & current
Week 2	Power & Energy
Week 3	Dependent and Independent sources
Week 4	Ohm's laws
Week 5	series & parallel connections
Week 6	Delta- star connections and transformations
Week 7	Kirchhoff's Current & Voltage Laws (KCL), (KVL)
Week 8	Source transformation
Week 9	Linearity & superposition
Week 10	Nodal analysis
Week 11	Mesh analysis
Week 12	Thevenin's Theorem
Week 13	Norton's Theorem

Week 14	Max. power transfer
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Basic Information
Week 3	Exp.2 Ohm's law
Week 5	Exp. 3: Voltage and current division
Week 7	Exp.4 Kirchhoff's law
Week 9	EXP.5 superposition theory
Week 11	EXP.6 Thevenin theory
Week 13	EXP . 7: Maximum power transfer D.C. Circuit Theorems

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1:ENGINEERING CIRCUIT ANALYSIS EIGHTH EDITION by William H.Hayt.Jr. 2: Introductory circuit analysis / Robert L. Boylestad.—11th ed.	Yes

Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	Yes
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Module Description Form of AC Circuit Analysis

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	AC Circuit Analysis			**Module Delivery**	
Module Type	Core			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEE216				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	UGI		**Semester of Delivery**	2	
Administering Department	Dept. of Biomedical Engineering- BME		**College**	College of Electronics Engineering- EE	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	Jun 01, 2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEE215	**Semester**	1

Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Energy storage element The capacitor , The inductor [7 hrs] Analysis of RC-transient circuits , Analysis of RL-transient circuits,RLC transient circuits Energy storage element [8 hrs] Analysis of AC-circuits The phasor equivalent circuits, Methods of Ac-circuit analysis [8 hrs] Analysis of AC-circuits Power factor and average power Complex power series and parallel resonance Power, voltage and current in three phase [15] hrs

	Delta and star connections Magnetic circuits Transformers [15 hrs] Revision problem classes [6 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something Like the main strategy that will be adopt in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieve through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7

	Projects / Lab.	1	10% (10)	Continuous	All
	Report/lab.	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The capacitor
Week 2	The inductor
Week 3	Analysis of RC-transient circuits
Week 4	Analysis of RL-transient circuits
Week 5	RLC transient circuits
Week 6	The phasor equivalent circuits
Week 7	Methods of Ac-circuit analysis
Week 8	Power factor and average power
Week 9	Complex power series and parallel resonance
Week 10	Power ,voltage and current in three phase
Week 11	Solved problems
Week 12	Delta and star connections
Week 13	Magnetic circuits
Week 14	Transformers
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	EXP.1 Oscilloscope fundamentals
Week 2	EXP.2 Basic of Capacitance and inductance

Week 3	EXP.3 Transit time
Week 4	EXP.4 RLC circuit
Week 5	EXP.5 LC parallel circuit
Week 6	EXP.6 Diode fundamentals
Week 7	EXP.7 Half and Full wave rectifiers

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1: ENGINEERING CIRCUIT ANALYSIS EIGHTH EDITION by William H.Hayt.Jr. 2: Introductory circuit analysis / Robert L. Boylestad.—11th ed.	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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MODULE DESCRIPTION OF MATHEMATICS II

وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Mathematics II			**Module Delivery**	
Module Type	Support			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEE207				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	UGI		**Semester of Delivery**	2	
Administering Department	Dept. of Biomedical Engineering- BME		**College**	College of Electronics Engineering- EE	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	Jun 01, 2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEE206	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop problem-solving skills achieved in NEBM102. 2. To dive into more advanced calculus analysis. 3. To understand what an integral is, and how it is related to derivatives. 4. To apply the integration of transcendental functions. 5. To tackle most integration techniques. 6. To familiarize oneself with the polar coordinates system, and graph important polar equations. 7. To tackle the subject of sequences and series, define tests for series convergence and the strategy to choose the suitable test for a given series. 8. Explore the subject of the power series, Taylor/Maclaurin series, and their applications. 9. The course primarily emphasizes Calculus 2.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Comprehend Integration, definite, and indefinite integrals. 2. Apply Integration of transcendental functions. 3. Perform techniques of integration including integration using algebraic substitutions, trigonometric substitutions, integration by partial fraction expansion, integration by parts, and further substitutions. 4. Understand applications of integrals such as Arc length, surface area, etc. 5. Use the polar coordinates system, and graphs polar equations. 6. Define Sequences and series. 7. Comprehending Special Series such as Geometric series, P series, alternating series, etc. 8. Examining series for convergence using series tests for convergence. 9. Understand the power series. 10. Recognize and analyze Taylor/Maclaurin series.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Integration– Define what an integral is, definite and indefinite integrals, techniques of integration including integration using algebraic substitutions, trigonometric substitutions, integration by partial fraction expansion, integration by parts, and further substitutions. The polar coordinates system, and graph important polar equations. sequences and series: Define sequences, Define Series, special series, tests for series convergence and the strategy to choose the suitable test for a given series, power series, Taylor/Maclaurin series, and their applications. Vector functions, partial derivatives, directional derivative, Gradient, Del operator, Divergence, and Curl

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy is to enhance the fundamental mathematical abilities of engineering students, which are essential for comprehending engineering disciplines efficiently. The topics covered in this course will serve as fundamental building blocks, enabling students to pursue specialized studies in various engineering and technological domains. vector functions, partial derivatives, directional derivative, Gradient, Del operator, Divergence, and Curl

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	15% (15)	6, 9, 11	LO #1, 3, 4, 7, and 10
	Assignments	2	15% (15)	2, 12	LO # 2, 5, 6 and 10
	Projects / Lab.	-	-	-	-
	Report	1	10% (10)	-	-

Summative assessment	**Midterm Exam**	3 hrs.	10% (10)	8	LO # 1-4
	Final Exam	3 hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	- Partial Fractions + - Integration by Partial Fraction Expansion.
Week 2	- Integration by parts.
Week 3	- Further substitutions + Arc length, surface area, etc.
Week 4	The Polar Coordinates system + Polar equations.
Week 5	Graphs of Polar equations.
Week 6	Mid Term Exam.
Week 7	Sequences and Series “the basics” + Special Series.
Week 8	Series – Convergence/Divergence + Integral Test.
Week 9	Comparison Test / Limit Comparison Test + Alternating Series Test.
Week 10	Absolute Convergence + Ratio Test + Root Test.
Week 11	Taylor/Maclaurin series.
Week 12	Vectors (review of Dot and cross products):
Week 13	- Vector functions. - Partial derivatives. - Directional derivative.
Week 14	- Gradient. - Del operator. - Curl - Divergence
Week 15	The preparatory **week before the** Final **Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	- Thomas's Calculus	Yes
Recommended Texts	- Linear Algebra and its applications by David C. Lay, Steven R. Lay & Judi J. McDonald, Fifth edition - Engineering Mathematics by O'Neil, sixth edition	No
Websites	https://www.coursera.org/learn/introduction-to-calculus#syllabus https://www.edx.org/learn/calculus https://www.khanacademy.org/math/calculus-1	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM of Computer programming
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer programming			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEEBM109				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UGI		**Semester of Delivery**	2	
Administering Department	Dept. of Biomedical Engineering- BME		**College**	College of Electronics Engineering- EE	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	Jun 01, 2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Understanding the computer components (hardware and software). 2. Learning about the algorithms types and how to build the algorithms. 3. Learning how to command computers to perform tasks using C language (Programming/coding). 4. Become acquainted with the designed programming including sequencing, condition, and iteration. 5. Learn about the 1d and 2d arrays in C language. 6. Learn about the functions in C language. 7. Learn about the strings in C language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the important components of the computer and its operating system. 2. Understanding the meaning of the algorithms in programming languages. 3. Understanding the basics concepts of C language programming such as variables, data types, operators, control 4. Understanding the utilities of each one of sequencing, condition, loops, and basic input/output operations. 5. Understanding how to represent the data in 1d arrays and 2d arrays. 6. Learn about how the strings are represented in C language. 7. Learn about dividing any problem in a sub-program and executing this problem by using a function. 8. In advanced practical experience by working on programming exercises and projects.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. ● Computer components (hardware and software) ● Visualization via flowchart and Pseudocode ● Key works, identifier, format specifier, and naming variables and constants ● Use standard libraries to take input and display output ● Operators in C programming ● Priorities in C programming ● Math functions ● Conditional operations ● Iterations (Loop operators) ● Arrays ● Functions ● Review classes and problem solving

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy being focused on is developing conceptual programming thinking, meanwhile refining and expanding their mathematical thinking skills. This will be achieved through classes, online lectures, interactive tutorials. Additionally, working on complex projects that challenge students' skills and require to apply advanced concepts. Such projects would help students exploring various aspects of C programming and gain hands-on experience in solving complex problems. some sampling activities that are interesting to the students.

Student Workload (SWL)

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	2	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2 hrs.	10% (10)	7	LO #1 - #7
	Final Exam	3 hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to computer Hardware and software components
Week 2	Flowchart and Pseudo-code
Week 3	Introduction to C programming: Declare variables and constants
Week 4	Assignment and Increment,Decrement, Arithmetic, Logical, and Bitwise operato
Week 5	Priorities of operators in C programming
Week 6	Relational and conditional operators
Week 7	If statement versus switch case statement
Week 8	Loop operators (For, while, do-while)
Week 9	Mid-term Exam
Week 10	Examples of structured programming (sequencing and condition)
Week 11	Arrays
Week 12	Functions

Week 13	String of characters
Week 14	pointers
Week 15	files
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1-2	learn the computer hardware components
Week 3-4	Declare variables and constants and <stdio.h> including printf and scanf standard functions
Week 5-6	Arithmetic, logical, and bitwise operators
Week 7-8	Math header for math functions <math.h> and Assignment and increment & decrement operators
Week 9-10	Relational and conditional operators and Loop operators
Week 11-12	Examples of the Arrays
Week 13-14	Examples of Functions and string

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	C Programming Absolute Beginner's Guide, 3rd Edition 2014. BY: Greg Perry and Dean Miller.	Yes
Recommended Texts	C How to Program with an introduction to C++, 8th Edition 2016. *BY: Paul Deitel and Harvey Deitel.* Global Edition contribution by Piyali Sengupta	No
Websites	1- https://www.programiz.com/c-programming 2- https://www.coursera.org/specializations/c-programming	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM of Medical Physics

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Medical Physics		**Module Delivery**	
Module Type	Basic		☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEEBM111			
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	UGI	**Semester of Delivery**	2	
Administering Department	Dept. of Biomedical Engineering- BME	**College**	College of Electronics Engineering- EE	
Module Leader		**e-mail**		
Module Leader's Acad. Title		**Module Leader's Qualification**		
Module Tutor		**e-mail**		

Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	Jun 01, 2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1-To know about the physical work of all body systems 2-Discuss the principal basics of medical instruments work (medical diagnostic using X-rays, MRI) 3-Radiological therapy and other related matters. 4-Improve the ability of the students to work in medical field and have medical skills and knowledge in this field
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1: Differentiate between the physical basic function of each body system of the human being. 2: have a good knowledge about the clinical physics 3:Lerning about Energy, work, and power of the body 4:Learning about Basic physic of lung and breathing 5: Learning about Eyes and vision mechanism 6:Learning about Sound in medicine and its applications 7:be aware of Physics of diagnostic x rays and it is applications 8:Study briefly about nuclear medicine 9:Study about Electricity within the body 10: know the physical basic of each medical instruments 11: learn how can apply the physics in human disease diagnosis
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to medical physics [2hrs] Energy, work, and power of the body [4hrs] Basic physics of the cardiovascular system [4hrs] Electricity within the body [4hrs] Physics of nuclear medicine [2hrs] Basic physic of lung and breathing [4hrs] Eyes and vision [2hrs] Sound in medicine [4hrs]

	Physics of diagnostic x rays [4hrs] x-ray [2hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. mention all the clinical instruments that are needed to investigate the organ systems and how they work. 2. ask an important question at the end of lectures that improve their thinking and their knowledge. 3. the student's response to the lecturer questions at the end of each lecture that improve their memory and ways of answer. 4. prepare a copybook about any physical experiment and discuss and answer any asked question from teachers.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to medical physics
Week 2	Energy, work, and power of the body
Week 3	Basics physics of the cardiovascular system
Week 4	Electricity within the body
Week 5	Physics of nuclear medicine
Week 6	Basic physic of lung and breathing
Week 7	Eyes and vision
Week 8	Sound in medicine
Week 9	Physics of diagnostic X rays
Week 10	Types of rays
Week 11	Radioactive pollution
Week 12	X-ray
Week 13	Micro wave spectra
Week 14	Ecological effect of disposed radioactive substances
Week 15	Light in medicine
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: The density of a liquid by means of a loaded test tube
Week 2	Lab 2: The falling of a small sphere through a viscous medium
Week 3	Lab 3: The specific heat capacity of a poor conductor by the method of mixtures
Week 4	Lab 4: The focal length of a concave mirror
Week 5	Lab 5: Determination of surface tension of water by rise in a capillary tube
Week 6	Lab 6: Linear absorption coefficient of materials
Week 7	Lab 7: Determination of a low resistance

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Medical Physics, John R.Cameron and James G.Skofronick	No
Recommended Texts		

Websites	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Description Form of Human Rights and Democracy

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Democracy and Human Rights	**Module Delivery**	
Module Type	Support	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVU12		
ECTS Credits	**2**		
SWL (hr/sem)	**50**		
Module Level	UGI	**Semester of Delivery**	2

Administering Department	Dept. of Biomedical Engineering- BME	**College**	College of Electronics Engineering- EE
Module Leader		**e-mail**	
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	Jun 01, 2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To understand what is meant by Democracy. 2. To be able to define the political system ideology, legitimacy and types. 3. To know the Islamic view of democracy. 4. To understand what is meant by human rights. 5. To study the historical evolution of human rights over the years. 6. To understand the importance of human rights protection and assurance.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Summarize what is meant by democracy. 2. Discuss the different ideologies, legitimacies and types of political systems. 3. Describe human rights and how it gradually developed. 4. Define democracy from the Islamic point of view. 5. Identify and discuss the meaning of human rights. 6. Discuss human rights laws, evolution, categories and protection and assurance.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A - Democracy</u>

	Definition of democracy, democratic systems, democracies patterns, democracy and state administration systems, the Islamic view of democracy. Part B – Human Rights Historical Evolution of Human Rights, Primitive societies, Pre-historic era, Religious Laws, Human Rights Evolution under Secular Laws, Human Rights Evolution under Secular Laws, Human Rights Evolution under Secular Laws, Human Rights: definition and categories, Human Rights Protection and Assurance.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	15% (15)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	-	-	-	-

	Report	1	15% (15)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Political systems: ideology, legitimacy and types
Week 2	Democracy system basics
Week 3	Democracies patterns
Week 4	Democracy and state administration systems
Week 5	Freedom of thinking, belief, access-free media and equality
Week 6	The Islamic view of democracy
Week 7	Mid-term Exam + Introduction to Human rights
Week 8	Primitive societies
Week 9	Religious Laws
Week 10	Human rights evolution under secular laws
Week 11	Definition and limitations of human rights
Week 12	Human rights categorizations
Week 13	Islamic law (Sharia) assurances
Week 14	National level assurances and international level assurances
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts		
Recommended Texts		

Websites	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Module Information

Module Title	**Computer skills**	**Module Delivery**	
Module Type	**Base**	☒ **Theory**	
Module Code	**NVU10**	☐ **Lecture**	
ECTS Credits	**3**	☐ **Lab**	
SWL (hr/sem)	**75**	☐ **Tutorial**	
		☒ **Practical**	
		☐ **Seminar**	
Module Level	1	**Semester of Delivery**	2
Administering Department	BME	**College**	NE
Module Leader		**e-mail**	**@uoninevah.edu.iq**
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor		**e-mail**	

Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	4/7/2023	**Version Number**	1.0

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	**General overview of personal computer architecture** **Computer peripherals, keyboard, screen, mouse, and storage media** **Computer ports, interfaces** **Overview operating systems** **Overview of windows operating system** **Introduction to windows 10** **Windows desktop, changing settings, starting programs** **Creating, deleting, copying, moving, searching for files and folders** **Using my computer, my document, and help facility** **Using windows control panel** **Using the windows accessories paint, notepad, word pad, …..etc** **Setup applications to windows, remove applications from windows** **Connecting to the internet, using the windows explorer** **Using the Microsoft Word** **Using the Microsoft Excel** **Using the PowerPoint**

Module Learning Outcomes	1. Understanding the important components of the computer 2. Understanding the important types of operating systems. 3. Understanding the windows operating system. 4. Understanding the Microsoft office word 2016. 5. Understanding the Microsoft office excel 2016. 6. Understanding the Microsoft power point 2016.
Indicative Contents	1. explain the components of computer hardware and software 2.introduction to the types of computers 3. storage media 4. computer ports 5. computer networks and the types of it 6. windows operating system 7. word office program 8. Excel program 9. power point office program

Learning and Teaching Strategies	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)			
Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	12	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	75		

Module Evaluation

		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	10% (10)	2, 4, 5,6	LO #1, 2, 10 and 11
	Assignments	1	10% (10)	14	LO # 3, 4, 6 and 7
	Projects / Lab.	0	0	0	LO # 3, 4, 6 and 7, 5, 8 and 10
	Report	1	20	14	
	Midterm Exam	1.5hr	30% (20)	10	LO # 1-4

Summative assessment	**Final Exam**	3hr	50% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to computer parts in hardware and software ,computer types, storage media
Week 2	Explain the computer ports , computer networks
Week 3	Explain the types of operating systems
Week 4	Windows orders(change the background, screen saver, resolution), change the status of files, printing files, copy and save of files, backups, Recycle bin ,compressing files, viruses
Week 5	Explain the paint program and the necessary required programs as well as types of files.
Week 6	Microsoft office word (creating new word file, bars , types and styles of fonts, copy and select of texts ,save of word file)
Week 7	
Week 8	MS WORD: spell checking, inserting symbols, add borders, change the document setup , insert table, page numbering, insert equations and effects)
Week 9	Exercises of creating many page in MS word
Week 10	MS Power point:(how to design professional presentation, change the layout of presentation and background of it, numbering slides, insert charts , insert table and audio)
Week 11	MS Power point(insert an effect to the object in slide, transition between slides , grouping of objects, insert equation, copy ,save and printing the slides then how to start the presentation)
Week 12	Exercises of creating many page in MS power point
Week 13	MS EXCEL (getting started with excel, how to create a spreadsheet, copy and rename the work book, entering and deleting of data in sheet, insert and delete of rows& columns, selecting cells, adding border to sheet)
Week 14	MS EXCEL: how to write a formula in sheet, functions, summation of data in row or column ,average function, max& min functions, count& counter, round function, save and print the spread sheet
Week 15	Exercises of creating many page in MS EXCEL
Week 16	**Preparatory week before the final Exam**
Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1-15	The application of each part of the covered drawing subject theoretically and according to the weekly sequence of the curriculum in the AutoCAD laboratory **Note: By two hours a week**

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1.**"Computer Science"**	No
Recommended Texts		No
Websites	https://www.tutorialsmate.com/2021/12/parts-of-computer	

Grading Scheme				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance.
	B - Very Good	جيد جدا	80 - 89	Above average with some errors.
	C - Good	جيد	70 - 79	Sound work with notable errors.
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings.
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria.
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work is required, but credit is given.
	F – Fail	راسب	(0-44)	A significant amount of work is required.

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.