البرنامج الدراسي لمرحلة البكالوريوس
قسم هندسة النفط (2022-2021)

(1) العناصر الرئيسية لمعايير الخطط الدراسية

تشمل الخطط الدراسية ثلاثة عناصر رئيسية هي:

- مقدمة عن الكلية ومتطلباتها.

هي احدى الكليات الخاصة انشات في محافظة كركوك ومارست مهامها العام الدراسي 2012/ 2013 بموجب موافقة وزارة التعليم العالي والبحث العلمي بكتابها العدد ج ﻫ 1655 في 26 /2013/3.

- تعريف بالأقسام ومناهجها.

نبذة عن القسم.

تم انشاء قسم هندسة النفط في 2/ 4/ 2016, آملين الى دوره الفعال في رفد الصناعة النفطية والغازية في العراق بكادر متميز من المهندسين الذين يحملون العلم الحديث والتكنلوجيا المعاصرة في مجال تقدم الصناعة النفطية ، كما ويعتبر هذا القسم مركز استشاري للمشاكل التي تتواجد ضمن الحقول النفطية ومصافي تكرير النفط الخام وبهذا يتم حل مشاكل وتطوير هذه المنشأة ورفع اقتصاد البلد.

- **أهداف القسم. ، الرسالة ، الرؤيا**

- **رساله القسم**

نظراً لامتلاك الوطن العربي 60 % من احتياطي النفط في العالم و حوالي 30 % من الغاز الطبيعي , ونظرا للتطور الكبير الذي شهده قطاع النفط والغاز في العراق وتلبية لحاجات سوق العمل أخذ القسم على عاتقه مهمة تأهيل مهندس بترول متميز في إمكاناته الأكاديمية والتطبيقية، ليقوم بإغناء القطاعين العام والخاص في مجال التنقيب عن النفط مستخدما أحدث التقانات لاجل النهوض بمتطلبات الصناعة النفطية المستقبلية محلياً وإقليميا.

- **الرؤيا**

نظراً لكون مجال هندسة النفط شامل وسريع التطور، ونظراً للتغيّر المستمر في حاجات سوق العمل فقد ارتأ القسم مراعاة هذين الجانبين في خطته الدراسية، وفي نشاطاته التطبيقية المرافقة لمهامه الأكاديمية.

- **أهداف القسم.**

يسعى القسم لاداء رسالته من خلال تحقيق الأهداف الآتية :

أ.   إعداد المهندسين في تخصص هندسة النفط وتأهيلهم بمستويات معرفية متميزة تواكب التقدم العلمي والتقني قادراً على تلبية الحاجات الفعلية والنهوض بمتطلبات الصناعة النفطية المستقبلية محلياً وإقليميا.

ب. تقديم خدمات التأهيل والتدريب للمؤسسات العامة والخاصة على نحو يسهم في رفع مستوى أداء العاملين وانتاجيتهم في هذه المؤسسـات من خلال ورش العمل والدورات الفنية، والمشاركة بالبحوث والدراسات العلمية والتطبيقية الهادفة إلى حل مسائل ومشاكل تقنية تهم التنمية الاقتصادية والاجتماعية للبلاد.

ج. تقديم خدمات ودراسات واستشارات فنية للمؤسسات العامة والخاصة تساعدها على حل مشاكل مهمة لديها بما ينسجم وتخصصات الكلية.

د.   تأسيس المختبرات العلمية التي تقوم بالبحوث العلمية والتطبيقية الهادفة والمتميزة وتشجيع الباحثين المتميزين، وحثهم على مشاركة الطلاب في البيئات البحثية واستخدام المنهجيات والأدوات البحثية.

ﻫ. تنمية مهارات التواصل لدى الطالب بحيث يكون قادراً على إيصال أفكاره إلى الآخرين واستيعاب وجهات نظرهم والتفاعل الإيجابي معها, وتفعيل الإرشاد والتوجيه الأكاديميين للطالب بما يحقق أفضل المستويات العلمية الممكنة.

و.   إنشاء روابط ثقافية وعلمية مع جامعات محلية وعربية وأجنبية من خلال الاتفاقيات العلمية والتي تساعد على تبادل الخبرات العلمية واتدريبية وتسهم في إنجاز بحوث ودراسات مشتركة.

- **ارتباطه بأهداف الكلية ورسالتها.**

للبرنامج الاكاديمي ارتباط وثيق بأهداف الكلية ورسالتها من خلال مهمة تأهيل مهندس بترول متميز في إمكاناته الأكاديمية والتطبيقية، ليقوم بإغناء القطاعين العام والخاص في مجال التنقيب عن النفط مستخدما أحدث التقانات لاجل النهوض بمتطلبات الصناعة النفطية المستقبلية محلياً وإقليميا.

- **شروط القبول بالقسم (شروط عامة).**

ان يكون الطالب حاصل على شهادة الثانوية العامة / الفرع العلمي بمعدل (73%)

- **متطلبات التخرج.**

مدة الدراسة لنيل شهادة البكالوريوس في الاختصاص المطلوب هي أربع سنوات, و يتطلب من الطالب الخريج النجاح بواقع 170 ساعة معتمدة للحصول على الشهادة في التخصص المطلوب.

- **الدرجات التي يمنحها القسم**

يمنح القسم شهادة بكالوريوس في هندسة النفط.

(2) الهيكل العام للخطة الدراسية

% من مجموع الوحدات	عدد الوحدات	المتطلبات
2.35	4	متطلبات عامة
41.76	71	متطلبات ساندة
55.88	95	متطلبات التخصص
100	170	المجموع

المتطلبات العامة

المتطلبات السابقة	عدد الساعات		عدد الوحدات	CODE/ NO	اسم المقرر	
	عملي	نظري				
-	2	2	2	KTB00101	Human Rights	1
-	2	2	2	KTB00202	Democracy	2
-	4	4	4		المجموع	

المتطلبات الساندة

المتطلبات السابقة	عدد الساعات		عدد الوحدات	CODE/ NO	اسم المقرر	ت
	عملي	نظري				
-	2	6	6	MAT10101	Mathematics	1
-	4	4	6	COP10102	Computer Programming	2
-	0	4	4	ENL10103	English Language I	3
-	6	2	4	END10104	Engineering Drawing and Descriptive Geometry	4
-	2	4	4	STD10105	Static's and Dynamics	5
-	0	4	4	PHY10106	Physics	6
-	2	2	3	ANC10107	Analytical Chemistry	7
-	2	2	3	ELT12108	Electrical Technology	8
-	2	6	6	MAT10209	Mathematics	9
-	4	2	4	COP10210	Computer Programming	10
-	0	4	4	ENL10211	English Language II	11
-	4	4	5	FLM10212	Fluid Mechanics	12
-	1	3	3	ENT11213	Engineering Thermodynamics	13
-	3	2	3	STM12214	Strength of Materials	14
-	2	6	6	ENM10315	Engineering Mathematics	15
-	0	4	4	TEE10316	Technical English	16
-	1	2	2	ENS12317	Engineering Statistics	17
-	35	61	71		المجموع	

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متطلبات التخصص

المتطلبات السابقة	عدد الساعات		عدد الوحدات	CODE/ NO	اسم المقرر	ت
	عملي	نظري				
-	4	6	8	PEN20101	General Geology	1
-	3	1	2	PEN21202	Petroleum Properties	2
-	2	4	4	PEN20203	Fundamentals of Petroleum Engineering	3
-	4	4	6	PEN20204	Structural and Petroleum Geology	4
-	6	6	8	PEN20305	Petroleum Reservoir Eng. I	5
-	6	6	8	PEN20306	Petroleum Drilling Eng. I	6
-	2	4	4	PEN20307	Petroleum Production Eng. I	7
-	2	6	6	PEN20308	Well Logging	8
-	1	2	2	PEN21309	Geophysics	9
-	2	4	4	PEN20310	Petroleum Engineering Economics	10
-	0	3	3	PEN21411	Gas Technology	11
-	0	3	3	PEN22412	Optimization	12
-	3	2	3	PEN20413	Integrated Reservoir Management	13
-	4	4	6	PEN20414	Petroleum Reservoir Eng. II	14
-	4	4	6	PEN20415	Petroleum Drilling Eng. II	15
-	4	4	6	PEN20416	Petroleum Production Eng. II	16
-	0	6	6	PEN20417	Secondary Oil Recovery	17
	4	4	6	PEN20418	Numerical Methods and Reservoir Simulation	18
	4	2	4	PEN20419	Engineering Project	19
-	55	75	95		المجموع	

(3) البرنامج الدراسى لمرحلة البكالوريوس

السنة الأولى

Cod	Subject Title	First Semester				Second Semester			
First Year		Credit Hours	Weekly Hours			Credit Hours	Weekly Hours		
			The.	*Tut.*	*Lab.*		*The.*	*Tut.*	*Lab.*
KTB00101	Human Rights	1	1	1	0	1	1	1	0
MAT10101	Mathematics I	3	3	1	0	3	3	1	0
COP10102	Computer Programming I	3	2	0	2	3	2	0	2
ENL10103	English Language I	2	2	0	0	2	2	0	0
END10104	Engineering Drawing and Descriptive Geometry	2	1	0	3	2	1	0	3
STD10105	Static's and Dynamics	2	2	1	0	2	2	1	0
PHY10106	Physics	2	2	0	0	2	2	0	0
ANC12107	Analytical Chemistry	0	0	0	0	3	2	0	2
ELT12108	Electrical Technology	2	2	0	2	0	0	0	0
PEN20101	General Geology	4	3	0	2	4	3	0	2
Total		**21**	**18**	**3**	**7**	**22**	**18**	**3**	**9**

السنة الثانية

Cod	Subject Title	First Semester				Second Semester			
Second Year		Credit Hours	Weekly Hours			Credit Hours	Weekly Hours		
			The.	*Tut.*	*Lab.*		*The.*	*Tut.*	*Lab.*
KTB00202	Democracy	1	1	1	0	1	1	1	0
MAT10209	Mathematics II	3	3	1	0	3	3	1	0
COP10210	Computer Programming II	2	1	0	2	2	1	0	2
ENL10211	English Language II	2	2	0	0	2	2	0	0
ELM10212	Fluid Mechanics	2	2	1	0	3	2	1	2
ENT11213	Eng. Thermodynamics	3	3	1	0	0	0	0	0
STM12214	Strength of Materials	0	0	0	0	3	2	1	2
PEN21202	Petroleum Properties	2	1	0	3	0	0	0	0
PEN20203	Fundamentals of Petroleum Engineering	2	2	1	0	2	2	1	0
PEN20204	Structural and Petroleum Geology	3	2	0	2	3	2	0	2
Total		**20**	**17**	**5**	**7**	**19**	**15**	**5**	**8**

Third Year		First Semester				Second Semester			
Cod	Subject Title	Credit Hours	Weekly Hours			Credit Hours	Weekly Hours		
			The.	Tut.	Lab.		The.	Tut.	Lab.
ENM10315	Engineering Mathematics	3	3	1	0	3	3	1	0
TEE10316	Technical English	2	2	0	0	2	2	0	0
ENS12317	Engineering Statistics	0	0	0	0	2	2	1	0
PEN20305	Petroleum Reservoir Eng. I	4	3	1	2	4	3	1	2
PEN20306	Petroleum Drilling Eng. I	4	3	1	2	4	3	1	2
PEN20307	Petroleum Production Eng. I	2	2	1	0	2	2	1	0
PEN20308	Well Logging	3	3	1	0	3	3	1	0
PEN21309	Geophysics	2	2	1	0	0	0	0	0
PEN20310	Petroleum Engineering Economics	2	2	0	0	2	2	0	0
Total		**22**	**20**	**6**	**4**	**22**	**20**	**6**	**4**

Fourth Year		First Semester				Second Semester			
Cod	Subject Title	Credit Hours	Weekly Hours			Credit Hours	Weekly Hours		
			The.	Tut.	Lab.		The.	Tut.	Lab.
PEN21411	Gas Technology	3	3	0	0	0	0	0	0
PEN22412	Optimization	0	0	0	0	3	3	0	0
PEN20413	Integrated Reservoir Management	1	1	1	0	2	1	1	1
PEN20414	Petroleum Reservoir Eng. II	3	2	2	0	3	2	2	0
PEN20415	Petroleum Drilling Eng. II	3	2	2	0	3	2	2	0
PEN20416	Petroleum Production Eng. II	3	2	2	0	3	2	2	0
PEN20417	Secondary Oil Recovery	3	3	0	0	3	3	0	0
PEN20418	Numerical Methods and Reservoir Simulation	3	2	0	2	3	2	0	2
PEN20419	Engineering Project	2	1	0	2	2	1	0	2
Total		**21**	**16**	**7**	**4**	**22**	**16**	**7**	**5**

(4) وصف المقررات

متطلب سابق	وصف موجز للمقرر	اسم المقرر	رمز المقرر
-	WHAT ARE HUMAN RIGHTS GROUPS HUMAN RIGHTS CHARACTERISTICS OF HUMAN RIGHTS OBJECTIVES OF THE ROOTS OF HUMAN RIGHTS HUMAN RIGHTS AND HISTORICAL DEVELOPMENT OF HUMAN RIGHTS IN THE MESOPOTAMIAN CIVILIZATIONS OTHER HUMAN RIGHTS HUMAN RIGHTS HUMAN RIGHTS IN THE ISLAMIC CIVILIZATION IN THE MIDDLE AGES IN MODERN HUMAN RIGHTS UNIVERSAL DECLARATION OF HUMAN RIGHTS 1948 HUMAN RIGHTS IN ARABIC AND INTERNATIONAL CHARTERS SUMMARY FROM THE INTERNATIONAL CONVENTION ON THE RIGHTS OF THE CHILD OF 1989, THEIR OWN WALBROTOKLAN HOW TO GET A COMMUNITY ETHIC OF LOVE, PEACE AND RESPECT FOR HUMAN RIGHTS	HUMAN RIGHTS	KTB00101
-	تعريفها –التطور التاريخي والفكري للديمقراطية في المجتمع الديمقراطية في نظام الحكم الاسلامي الديمقراطية في نظام الحكم الاسلامي الديمقراطية في الفكر السياسي المعاصر – خصائص الديمقراطية –نماذج الديمقراطية –اركان الديمقراطية –الانتخابات –اهمية الديمقراطية في المجتمع – مزايا الديمقراطية –عيوب الديمقراطية عوائق تطبيق الديمقراطية في العراق – اشكال الحكومات	DEMOCRACY	KTB00202
-	TYPES OF FUNCTIONS (TRIGONOMETRIC; INVERSE TRIGONOMETRIC FUNCTIONS, LOGARITHMIC FUNCTIONS, EXPONENTIAL FUNCTIONS, TRANSCENDENTAL FUNCTIONS, OTHER TYPES OF FUNCTIONS, GRAPH OF FUNCTIONS); DIFFERENTIATION (EXPLICIT AND IMPLICIT; APPLICATION OF DERIVATIVES IN GRAPHING); INTEGRALS (INTEGRALS AS A SUMMATION OF AREAS; DEFINITE INTEGRALS, APPLICATIONS OF DEFINITE INTEGRALS, AREAS AND VOLUMES; TECHNIQUES OF INTEGRATION); DETERMINANTS AND MATRICES, CONICAL SECTION; INTRODUCTION TO POLAR COORDINATES.	MATHEMATICS I	MAT10101

-	USING EXCEL (INTRODUCTION, NAVIGATING THE INTERFACE, ENTERING DATA, SETTING CELL DATA TYPES, SELECTING MORE THAN A SINGLE CELL, ENTERINGFORMULAS, EXPLORING THE R1C1 CELL REFERENCE STYLE, REFERRING TO MORE THAN A SINGLE CELL, UNDERSTANDING OPERATOR PRECEDENCE, USING EXPONENTS IN FORMULAS, FORMATTING YOUR SPREADSHEETS, LEVERAGING COPY, CUT, PASTE, AND PASTE SPECIAL, USING CELL NAMES, VALIDATING DATA, TAKING ADVANTAGE OF MACROS, ADDING COMMENTS AND EQUATION NOTES), CHARTING (CREATING SIMPLE CHARTS, EXPLORING CHART STYLES, FORMATTING CHARTS, CUSTOMIZING CHART AXES, SETTING LOG OR SEMILOG SCALES, USING MULTIPLE AXES, CHANGING THE TYPE OF AN EXISTING CHART, COMBINING CHART TYPES, BUILDING 3D SURFACE PLOTS, PREPARING CONTOUR PLOTS, ANNOTATING CHARTS, SAVING CUSTOM CHART TYPES, COPYING CHARTS TO WORD), GETTING ACQUAINTED WITH VISUAL BASIC FOR APPLICATIONS (NAVIGATING THE VBA EDITOR, WRITING FUNCTIONS AND SUBROUTINES, WORKING WITH DATA TYPES, DEFINING VARIABLES, DEFINING VARIABLES, USING ARRAYS, COMMENTING CODE, SPANNING LONG STATEMENTS OVER MULTIPLE LINES, USING CONDITIONAL STATEMENTS, USING LOOPS, DEBUGGING VBA CODE, VBA'S BUILT-IN FUNCTIONS, EXPLORING EXCEL OBJECTS, CREATING YOUR OWN OBJECTS IN VBA)	COMPUTER PROGRAMMING	COP10102
-	PARTS OF SPEECH (NOUNS, PRONOUNS, VERBS, ADVERBS, PREPOSITIONS, CONJUNCTIONS, INTERJECTIONS); KINDS OF SENTENCES (SIMPLE, COMPOUND, COMPLEX); SUBORDINATE CLAUSES; CHANGE OF SENTENCES FROM SIMPLE TO COMPOUND AND VICE VERSA; TENSES; PASSIVE AND ACTIVE; DIRECT AND INDIRECT SPEECH.	ENGLISH LANGUAGE I	ENL10103
-	**ENGINEERING DRAWING:** INTRODUCTION, INSTRUMENTS & THEIR USE; APPLIED GEOMETRY; DIMENSIONS & LETTERING; ORTHOGRAPHIC DRAWING & SKETCHING; PICTORIAL DRAWING & SKETCHING AUXILIARY VIEW; SECTION; CONVECTION &ASSEMBLY; PROJECTION IN GENERAL. **DESCRIPTIVE GEOMETRY:** REPRESENTATION OF POINTS, LINES, AND PLANES; TYPES OF PLANES; APPLICATION OF LINES AND PLANES; DEVELOPMENT OF SURFACES; DETERMINATION OF TRUE LENGTHS OF STRAIGHT LINES BY REVOLUTION AND AUXILIARY PLANES; TRACES OF PLANES; FINDING LINE OF INTERSECTION OF PLANES BY TRACES AND PROJECTIONS.	ENGINEERING DRAWING AND DESCRIPTIVE GEOMETRY	END10104
-	STATIC & DYNAMIC PRINCIPLES; RESULTANT OF FORCES; FRICTION; CENTER OF GRAVITY; MOMENT OF INERTIA; RECTILINEAR MOTION; CURVILINEAR MOTION; ROTATION; ENERGY & WORK; MECHANICAL VIBRATION.	STATIC'S AND DYNAMICS	STD10105

-	THE COURSE INCLUDES AN INTRODUCTION TO INTRODUCE YOU TO ENGINEERING **THERMODYNAMICS:** (ENERGY AND ITS CONSERVATION, ENERGY, WORK, POWER, INTERNAL, POTENTIAL, AND KINETIC ENERGY). **HEAT TRANSFER:** (HEAT TRANSFER THEORIES, CONCEPTS OF HEAT CONDUCTION AND HOMO. PLANE WALL, STEADY-STATE CONDUCTION ONE-DIM. FOR HETEROGENEOUS, PLANE WALL, STEADY-STATE CONDUCTION ONE-DIM. FOR CYLINDER WALL, STEADY-STATE CONDUCTION ONE-DIM. FOR SPHERICAL SYSTEM, CONVECTION HEAT TRANSFER, RADIATION HEAT TRANSFER, HEAT EXCHANGER TYPES, HEAT EXCHANGER THEORIES). **FLUIDS:** (BASIC OF FLUIDS, PASCAL'S PRINCIPLE, ARCHIMEDES PRINCIPLE, SURFACE TENSION AND INTERFACIAL TENSION, CONTACT ANGLE, WETTING PHENOMENA, CAPILLARY PRESSURE) **SIMPLE HARMONIC MOTION :** (PERIODIC MOTION, THE POTENTIAL ENERGY OF SPRING, WAVE MOTION, SPEED OF A TRANSVERS WAVE ON A SPRING, REFLECTION OF WAVE AT A BOUNDARY, THE TRANSMISSION OF ENERGY IN A WAVE). **ELECTRIC:** (COULOMBS LAW AND ELECTRICAL FIELD, GAUSS'S LAW, ELECTRICAL POTENTIAL, POWER STATION THEORIES, POWER STATION TYPES).	PHYSICS	PHY10106
-	THEORY: REVIEW OF BASIC CONCEPTS; STOICHIOMETRY; CHEMICAL REACTION AND HEAT; ORGANIC CHEMISTRY; FUELS; VARIOUS BATTERIES AND ELECTRONIC CELLS; PRINCIPLES OF CORROSION; WATER FOR DOMESTIC USES; INDUSTRIAL WATER; ATMOSPHERIC POLLUTION.	ANALYTICAL CHEMISTRY	ANC10107
-	D.C. CIRCUITS, A.C. CIRCUITS, MAGNETIC CIRCUITS, D.C. MACHINES, TRANSFORMERS & INDUCTION MOTORS, MEASURING INSTRUMENTS; VOLTAGE, CURRENT, RESISTANCE POWER AND TEMPERATURE; LABORATORY EXPERIMENTS.	ELECTRICAL TECHNOLOGY	ELT12108
-	POLAR COORDINATES (GRAPHS IN POLAR COORDINATES; ARC LENGTH AND AREAS IN POLAR COORDINATES); VECTORS IN TWO AND THREE SPACE (CROSS PRODUCTS; VECTOR VALUED FUNCTIONS; MOTION ALONG CURVES; DIFFERENTIATION AND INTEGRATION OF VECTOR VALUED FUNCTIONS); INFINITE SERIES (DIVERGENCE AND CONVERGENCE OF SERIES, TAYLOR AND MACLAURIAN SERIES); FUNCTIONS OF MORE THAN ONE VARIABLE (PARTIAL DIFFERENTIATION ; EXTREME VALUES, GRADIENTS; LAGRANGE MULTIPLIER); MULTIPLE INTEGRALS, CHANGE OF ORDER; CHANGE FROM CARTESIAN TO POLAR COORDINATES; FIRST ORDER DIFFERENTIAL EQUATIONS; INTRODUCTION TO SECOND ORDER DIFFERENTIAL EQUATIONS.	MATHEMATICS II	MAT10209
-	FORTRAN 90, MATHLAB.	COMPUTER PROGRAMMING	COP10210
-	PUNCTUATIONS; PHONETICS AND SPELLING; REGULAR AND IRREGULAR VERBS; WORDS AND PHRASES THAT REQUIRE SPECIAL ATTENTION; IDIOMS WITH COMMON VERBS; WRITING (COMPOSITION, LETTERS, ESSAYS).	ENGLISH LANGUAGE II	ENL10211

-	DIMENSIONS & UNITS, PROCESS VARIABLES; PHYSICAL STATE; OVERALL MASS BALANCE; OVERALL ENERGY BALANCE; OVERALL MOMENTUM BALANCE, CONCEPT OF FLUID BEHAVIOR; NEWTONIAN AND NON-NEWTONIAN FLUIDS, FLOW MEASUREMENTS; PITOT TUBE; VENTURI METER, ORIFICE METER; ROTA METER; SOME DESIGN EQUATIONS FOR THE FLOW OF INCOMPRESSIBLE FLUIDS; FRICTION LOSSES IN PIPES AND FITTINGS; TWO-PHASE FLOW; FLUID MACHINERY.	FLUID MECHANICS	FLM10212
-	THE COURSE INCLUDES AN INTRODUCTION TO INTRODUCE YOU TO; **THE FUNDAMENTAL CONCEPTS OF ENGINEERING THERMODYNAMICS:** (THERMAL SYSTEMS, UNIT AND DIMENSION, FORCE, WORK, ENERGY, HEAT, PRESSURE, AND TEMPERATURE). **THE IDEAL GAS LAWS AND IDEAL GAS MIXTURES:** (CHARL'S LAW AND BOYLE'S LAW, AVOGADRO HYPOTHESIS, DALTON'S LAW, AMAGAT'S LAW). **THE REAL GAS LAWS AND REAL GAS MIXTURES:** (COMPRESSIBILITY AND EQUATION OF STATE) **THE FIRST LAW OF THERMODYNAMICS FOR CLOSED AND OPEN SYSTEM:** (CONSERVATION OF MASS AND ENERGY). **GENERAL APPLICATIONS OF THE FIRST LAW OF THERMODYNAMICS FOR OPEN SYSTEM:** (NOZZLES AND DIFFUSERS, TURBINES, COMPRESSORS AND PUMPS, HEAT EXCHANGERS, AND THROTTLING DEVICES). **THE SECOND LAW OF THERMODYNAMICS AND ENTROPY, GENERAL APPLICATION OF THE FIRST AND SECOND LAWS:** (STEAM POWER CYCLES, HEAT ENGINES CYCLES, REFRIGERATION AND LIQUEFACTION PROCESSES). **VAPOUR-LIQUID EQUILIBRIUM:** (BINARY, AND MULTI-COMPONENT SYSTEM).	ENGINEERING THERMODYNAMICS	ENT11213
-	STRESS; SIMPLE STRESS, SHEARING STRESS, BEARING STRESS, THIN WALL CYLINDERS, STRAIN, STRESS DIAGRAM, HOOK LAW, POISSON'S RATIO, THERMAL STRESS; TORSION; TORSION FORMULA, FLANGED BOLT; COUPLING HELICAL SPRINGS; SHEAR AND BENDING MOMENTS DIAGRAMS; ANALYTICAL AND GRAPHICAL DEFLECTION; BUCKLING; SPECIAL TOPICS.	STRENGTH OF MATERIALS	STM12214
-	ORDINARY DIFFERENTIAL EQUATIONS, PARTIAL DIFF. EQUATIONS, SOLUTIONS OF ORDINARY DIFF. EQUATIONS, APPLICATIONS OF FIRST AND SECOND ORDER ORDINARY DIFF. EQUATIONS; SOLUTIONS BY LAPLACE TRANSFORMS; BESSEL FUNCTIONS; FOURIER SERIES; TAYLOR SERIES; NUMERICAL METHODS.	ENGINEERING MATHEMATICS	ENM10315
-	GENERAL STUDY OF ENGLISH LANGUAGE THROUGH THE USE OF SUBJECTS RELATED TO THE SPECIALIZATION OF THE DEPARTMENT SUCH AS: PETROLEUM INDUSTRY, PETROLEUM EXPLORATION, DRILLING FOR OIL, RECOVERING OIL, OIL TRANSPORTATION, OIL REFINERY, CAREERS IN THE PETROLEUM INDUSTRY.	TECHNICAL ENGLISH	TEE10316
-	IMPORTANCE OF STATISTICS; DESCRIPTIVE AND INFERENTIAL STATISTICS; PICTORIAL DESCRIPTION OF DATA; RANDOM SAMPLE SELECTION; DATA CLASSIFICATIONS; FREQUENCY DISTRIBUTIONS; CUMULATIVE FREQUENCY DISTRIBUTIONS; GRAPHICAL REPRESENTATION OF DATA HISTOGRAMS; FREQUENCY POLYGON; MEASURES OF PROBABILITY VARIATION AND THE BINOMIAL DISTRIBUTIONS; POISSON DISTRIBUTION; NORMAL DISTRIBUTION; CORRELATION AND REGRESSION ANALYSIS.	ENGINEERING STATISTICS	ENS12317

	Description	Course	Code
-	EARTH IN SPACE; SHAPE AND SURFACE RELIEF OF THE EARTH; MATTER AND MINERALS; IGNEOUS, SEDIMENTARY AND METAMORPHIC ROCKS; WEATHERING AND SOILS; PROCESSES OF EROSION, TRANSPORTATION AND DEPOSITION; GROUND WATER; CRUSTAL DEFORMATION (STRUCTURAL FEATURES) AND MOUNTAIN BUILDING MOVEMENTS; EARTHQUAKES AND THE EARTH'S INTERIOR; KEYS TO THE PAST; TIME IN GEOLOGY; HISTORICAL GEOLOGY; PLATE TECTONICS AND CONTINENTAL DRIFT.	General Geology	PEN20101
-	CRUDE OILS (CHEMICAL COMPOSITION, CLASSIFICATION, PROPERTIES); DENSITY, SPECIFIC GRAVITY AND COEFFICIENT OF EXPANSION; VISCOSITY, MOLECULAR WEIGHT; VAPOR PRESSURE, SPECIFIC HEAT; LATEN HEAT; HEAT OF COMBUSTION; BOILING RANGE, FLASH POINT; POUR POINT, SULFUR CONTENT; ANILINE POINT; PENETRATION UMBER; SOFTENING POINT; CRUDE OIL EVALUATION; FRACTIONAL DISTILLATION AND TBP CURVE; ANALYSIS OF FRACTION; DEHYDRATION OF CRUDE OIL; NATURAL GAS PROPERTIES; OILFIELD WATER PROPERTIES.	Petroleum Properties	PEN21202
-	ELEMENTS OF PETROLEUM ENGINEERING; ORIGIN OF PETROLEUM; RESERVOIR ROCK PROPERTIES AND FLUID DISTRIBUTION; VOLUMETRIC CALCULATIONS OF OIL IN PLACE; NATURAL FORCES IN OIL AND GAS RESERVOIRS; OIL EXPLORATION; ROTARY DRILLING; RIG COMPONENTS; CASING, CEMENTING AND WELL COMPLETION; WELL LOGGING; SURFACE EQUIPMENT; IRAQI OIL FIELDS.	Fundamentals of Petroleum Engineering	PEN20203
-	MECHANICS OF STRUCTURAL DEFORMATION; FOLDS, FAULTS, AND JOINTS; UNCONFORMITIES; SEDIMENTARY ENVIRONMENTS; ORIGIN OF OIL: GENERATION, MIGRATION AND ACCUMULATION OF PETROLEUM; SOURCE ROCKS; RESERVOIR ROCKS, CAP ROCKS, TRAPS (TYPES AND DISCOVERING TECHNIQUES); RESERVOIR MECHANICS (PRESSURE, TEMPERATURE, RESERVOIR ENERGY); SUBSURFACE MAPPING; OIL FIELD WATERS, IRAQ AND MIDDLE EAST OILFIELDS.	Structural and Petroleum Geology	PEN20204

-	TYPES OF TRAPS; FLUIDS DISTRIBUTION; TYPES OF OIL RESERVOIRS; POROSITY, COMPRESSIBILITY; PERMEABILITY; POUESELI LAW, KOZENY EQUATION, DARCY'S LAW; MEASUREMENTS OF PERMEABILITY, KLINKENBERG EFFECT; GAS FLOW EQUATION; RADIAL FLOW; PRODUCTIVITY EQUATION; RADIAL FLOW OF GAS; AVERAGE PERMEABILITY FOR STRATIFIED RESERVOIRS; FLOW THROUGH CHANNELS AND FRACTURES; SATURATION; CAPILLARY PRESSURE; WETTABILITY; MULTIPHASE FLOW THROUGH POROUS MEDIA; LINEAR FLOW (PISTON LIKE, LEAKY PISTON); EFFECTIVE AND RELATIVE PERMEABILITY; CALCULATION OF RELATIVE PERMEABILITY; FRACTIONAL FLOW EQUATION; BUCKLEY-LEVERETT EQUATION; GAS PROPERTIES (BOYLE AND CHARLES LAWS; AVOGADRO LAW; DALTON LAW, EQUATION OF STATE); COMPRESSIBILITY FACTOR; LIQUIDS PROPERTIES (PVT); VISCOSITY, CLASSIFICATION OF RESERVOIRS ACCORDING TO P-T DIAGRAM, PHASE BEHAVIOR; CALCULATION OF BUBBLE POINT AND DEW POINT; BEHAVIOR OF NON-IDEAL LIQUIDS; FLASH AND DIFFERENTIAL DEGASSING; DETERMINATION OF RESERVOIR LIQUIDS; PROPERTIES OF FORMATION WATER; VOLUMETRIC CALCULATION OF RESERVOIRS; ISOBAR, ISOBACH, ISOPOROSITY AND BUBBLE MAPS. MATERIAL BALANCE EQUATION; MATERIAL BALANCE FOR WATER DERIVE AND GAS DERIVE RESERVOIRS; CALCULATION OF RESERVOIR PRESSURES.	Petroleum Reservoir Eng. I	PEN20305
-	INTRODUCTION TO DRILLING; CLASSIFICATION OF DRILLING OPERATIONS; PROPERTIES AND FUNCTIONS OF DRILLING FLUID; TYPES AND PROPERTIES OF CLAY IN WATER; TYPES OF DRILLING FLUIDS; DRILLING HAZARDS DEPENDENT ON MUD CONTROL; DRILLING MUD CALCULATIONS, DRILLING METHODS (CABLE TOOL DRILLING, ROTARY DRILLING), BASIC COMPONENT OF ROTARY DRILLING EQUIPMENT; DRILLING STRING AND ACCESSORIES; TYPES OF BITS; CASING OF OIL WELLS; FUNCTIONS OF CASING, TYPES OF CASING, STRINGS, PARAMETERS OF CASING DESIGN, SELECTION OF CASING AND BIT TYPES, DESIGN OF STRING, GRAPHICAL DESIGN OF CASING; CEMENTING OF OIL WELLS, CLASSIFICATION AND PROPERTIES OF CEMENTS, CLASSIFICATION OF CEMENTING OPERATIONS, CEMENTING EQUIPMENT, METHODS AND CALCULATIONS OF CEMENTING; HYDRAULICS OF PRIMARY CEMENTING OPERATIONS.	Petroleum Drilling Eng. I	PEN20306
-	WELL COMPLETION OPERATIONS (PARAMETER OF DESIGN, COMPLETION METHODS, EQUIPMENT, COMPLETION FLUIDS); PERFORATION OF OIL AND GAS WELLS (PERFORATION METHODS, SELECTION OF PERFORATION INTERVALS); WATER AND GAS CONING; METHODS FOR DETERMINING OIL PRODUCTION RATE WITHOUT CONING; COMPLETION EFFICIENCY, DRILL STEM TEST (DTS) (TEST METHOD, EQUIPMENT, PRESSURE VERSUS TIME CURVE, THEORY OF PRESSURE BUILDUP, RESERVOIR PROPERTIES OBTAINED, DEPLETION); HELICAL BUCKLING OF TUBING (FORCES, HOMOGENEOUS COMPLETION, PACKERS PERMITTING FREE AND LIMITED MOTIONS, COMPOUND COMPLETION OF WELLS); SURFACE GATHERING SYSTEMS (TYPES OF GATHERING SYSTEMS, BEHAVIOR OF FLUID FLOW, FLOW LINES, ESSENTIAL FLOWING LINES, VALVES); SEPARATION OF OIL, GAS, & WATER (TYPES OF SEPARATORS, COMPONENTS OF SEPARATORS AND FUNCTIONS); OIL STORAGE (STORAGE TANKS AND ACCESSORIES, CALIBRATION, MEASUREMENT OF LIQUID LEVEL); PRODUCTION BY PUMPS (SUCKER AND SUBMERSIBLE PUMPS).	Petroleum Production Eng. I	PEN20307

-	BASIC ROCK PROPERTIES, PETROPHYSICS; SP LOG; CONVENTIONAL RESISTIVITY LOG, INDUCTION LOG; LATERAL LOG, MACRO RESISTIVITY LOG, SONIC LOG, DENSITY LOG, NEUTRON LOG, GAMMA RAY LOG, TDT LOG, CBL LOG AND QUICK METHOD IN (HC) DETECTION.	Well Logging	PEN20308
-	GRAVITY PROSPECTING: PRINCIPLES, INSTRUMENTS, FIELD MEASUREMENTS & REDUCTIONS; INTERPRETATIONS; SEISMIC PROSPECTING: WAVE PROPAGATION, INSTRUMENTS, REFRACTION AND REFLECTION METHODS, INTERPRETATION; MAGNETIC PROSPECTING: PRINCIPLES, INSTRUMENTS, MEASUREMENTS & INTERPRETATION; AIRBORNE MAGNETOMETER.	Geophysics	PEN21309
-	OIL AND GAS RESERVE, ORGANIZATIONS OF PETROLEUM EXPORTING AND IMPORTING COUNTRIES, INTERNATIONAL SUPPLY AND DEMAND OF PETROLEUM, CLASSIFICATION OF PETROLEUM, PETROLEUM PRICING, ALTERNATIVE ENERGY, INTERNATIONAL STRATEGY OF ENERGY, TIME VALUE OF MONEY, TYPES OF INTEREST RATES, RATE OF RETURN, METHODS OF ENGINEERING DECISIONS, DEPRECIATION, DEPLETION, AMORTIZATION, TAXATION, INFLATION, SENSITIVITY ANALYSIS OF ENGINEERING PROJECTS, RISK ANALYSIS PRODUCTION DECLINE CURVES, EVALUATION OF FUTURE PRODUCTION OF OIL AND GAS WELL SAND ,EXPENDITURE AND NET PRESENT VALUE.	Petroleum Engineering Economics	PEN20310
-	PROPERTIES OF GASES; GAS SYSTEM ANALYSIS; GAS FLOW THROUGH P. M.; GAS TRANSPORTATION, GAS TREATMENT & LIQUEFACTION; GAS SWEETENING AND DEHYDRATION.	Gas Technology	PEN21411
-	INTRODUCTION, APPLICATIONS IN OPTIMIZATION, LINEAR PROGRAMMING, APPLICATIONS IN LINEAR PROGRAMMING, GRAPHICAL METHOD, APPLICATIONS IN GRAPHICAL METHOD, SIMPLEX METHOD, APPLICATIONS IN SIMPLEX METHOD, TRANSPORTATION METHOD, APPLICATIONS IN TRANSPORTATION METHOD, NONLINEAR PROGRAMMING, APPLICATIONS IN NONLINEAR PROGRAMMING, LAGRANGE MULTIPLIER METHOD, APPLICATIONS IN LAGRANGE MULTIPLIER METHOD.	Optimization	PEN22412
-	WHAT IS RESERVOIR MANAGEMENT?, THE BASE MAP, ISOPACH MAP, NET PAY THICKNESS, CROSS SECTIONS, WELL CORRELATION USING LOGS, ISOPOROSITY MAP, BUBBLE MAP, ROUTINE MAP, ANALYSIS, SPECIAL CORE ANALYSIS, SCREENING OF CORE DATA, USING CORRELATIONS TO ESTIMATE MISSING DATA, CALCULATION OF INITIAL FLUIDS IN PLACE, MATERIAL BALANCE, DETERMINATION OF RESERVOIR TYPE, BUILDING RESERVOIR MODEL, HISTORY MATCHING, OPTIMIZATION OF SURFACE FACILITIES, SUGGESTIONS TO INCREASE PRODUCTION BY PLUGGING, PERFORATION, COMPLETION, ETC., DEVELOPMENT STRATEGIES, DRILLING NEW WELLS, COMPLETION, SUGGESTING ADDITIONAL NECESSARY SURFACE EQUIPMENTS, ECONOMIC EVALUATION OF THE PROPOSED STRATEGY.	Integrated Reservoir Management	PEN20413
-	FUNDAMENTAL CONCEPTS; OIL RESERVOIRS: DEPLETION DRIVE; GAS CAP DRIVE, WATER DRIVE, GRAVITY DRAINAGE RESERVOIR, COMBINATION DRIVE RESERVOIRS; PRESSURE MAINTENANCE; SECONDARY RECOVERY; GAS RESERVOIRS; GAS-CONDENSATE RESERVOIRS; MISCELLANEOUS SUBJECTS.	Petroleum Reservoir Eng. II	PEN20414

-	CASING LANDING (LANDING AS CEMENTED, LANDING IN TENSION AT THE FREEZE POINT, LANDING IN COMPRESSION AT THE FREEZE POINT); BUCKLING PHENOMENON, WELLHEAD LOADS, BLOWOUT AND BLOWOUT PREVENTION, WELL KICK (METHODS OF CONTROL, DRILLER'S METHOD, ENGINEER'S METHOD); FACTORS AFFECTING DRILLING RATE (EFFECT OF PRESSURE, EFFECT OF PHYSICAL PROPERTIES OF DRILLING MUD, EFFECT OF WEIGHT ON BIT AND ROTARY SPEED, ECONOMICAL EFFECT), HOLE PROBLEMS (PIPE STICKING, SURGE AND SWAB PRESSURE, HOLE DEVIATION); DIRECTIONAL DRILLING; FACTORS AFFECTING HOLE INCLINATION OF DIRECTIONAL WELLS; TYPES OF DIRECTIONAL WELLS; GEOMETRY OF A DIRECTIONAL WELL; METHODS OF CALCULATIONS OF DIRECTIONAL WELLS; HORIZONTAL DRILLING; TYPES OF HORIZONTAL WELLS; AIR DRILLING; DESIGN OF AIR DRILLING OPERATIONS.	Petroleum Drilling Eng. II	PEN20415
-	TYPES OF RESERVOIRS AND RADIAL FLOW IN THE RESERVOIRS, PRODUCTIVITY INDEX, INFLOW PERFORMANCE RELATIONSHIP (IPR), EFFECT OF STRATIFICATION AND WATER CUT ON IPR, PRODUCTIVITY INDEX TEST, VOGEL METHOD, STANDING METHOD, COUTO METHOD, FETKOVICH METHOD, AL-SAADOON METHOD, MATHEMATICAL AND PHYSICAL PRINCIPLES FOR PRESSURE DROP CALCULATIONS, FLOW PATTERN AND ITS RELATION WITH PRESSURE DROP, POETTMANN AND CARPENTER METHOD, DUKLER METHOD, WORKING CHARTS, ANALYSIS OF CHOKE PERFORMANCE, PREDICTION OF RESTRICTED AND UNRESTRICTED PRODUCTION, EFFECT OF OTHER PARAMETERS ON WELL PERFORMANCE, DERIVATION AND SOLUTIONS OF DIFFUSIVITY EQUATION, APPLICATION OF HORNER SOLUTION, MULTI-RATES TEST, BUILD-UP TEST ,DRAW-DOWN TEST, EFFECT OF SKIN FACTOR ON WELL TESTING, ANALYSIS OF TESTS THAT AFFECTED BY BARRIER, BOUNDED RESERVOIRS, GAS LIFT OPERATIONS, STIMULATION OPERATIONS (ACIDIZING AND FRACTURING).	Petroleum Production Eng. II	PEN20416
-	PRINCIPLES AND DEFINITIONS, CHOICE OF PROPER METHODS FOR ENHANCED OIL RECOVERY, RECOVERY BY WATER DISPLACEMENT, BUCKLEY-LEVERETT METHOD, WELGE MEHOD, STILES METHOD, ORIGINAL AND IMPROVED DYKSRA-PARSONS METHOD, PATTERN OF FLOODING, SWEEP EFFICIENCY, PROPERTIES OF INJECTED WATER, INJECTED PRESSURES, RECOVERY BY IMMISCIBLE GAS, TARNER METHOD, MUSKAT METHOD, RECOVERY BY MISCIBLE GAS, DRY GAS INJECTION, ENRICHED GAS INJECTION, CO_2 INJECTION, N_2 INJECTION, THERMAL RECOVERY, HEAT FLOW THROUGH ROCKS, SEAM INJECTION, INSITU COMBUSTION, TERTIARY OIL RECOVERY, SURFACTANT FLOODING,, SOLVENT INJECTION, POLYMER INJECTION.	Secondary Oil Recovery	PEN20417

-	INTERPOLATION,(LINEAR; LAGRANGE); MATRICES, REVIEW OF MATRIX PROPERTIES, DETERMINANTS, INVERSE OF MATRIX; SOLUTION OF SYSTEM OF LINEAR EQUATIONS (GAUSSIAN ELIMINATION, GAUSS JORDAN METHOD, JACOBI METHOD, GAUSS SEIDEL METHOD); LEAST SQUARE METHOD (LINEAR EQUATIONS; POLYNOMIAL EQUATIONS); RESERVOIR SIMULATION (INTRODUCTION, TYPES OF SIMULATORS); FLOW THROUGH POROUS MEDIA (DERIVATION OF SINGLE-PHASE, ONE-DIMENSIONAL FLOW EQUATION, TWO AND THREE-DIMENSIONAL FLOW EQUATION); FINITE DIFFERENCE METHOD (TAYLOR SERIES; FORWARD DIFFERENCE; BACKWARD DIFFERENCE; CENTRAL DIFFERENCE; CONCEPTS OF EXPLICIT AND IMPLICIT METHODS); SOLUTION OF SYSTEM OF DIFFERENCE EQUATIONS (TRIDIAGONAL ALGORITHM); USE OF IRREGULAR GRIDDING: TRANSMISSIBILITY; THE FINITE DIFFERENCE FORM OF THE FLOW EQUATION IN TERMS OF TRANSMISSIBILITY; AVERAGING OF ROCK AND FLUID PROPERTIES; SOLUTION OF RADIAL FORM OF THE FLOW EQUATION; TWO DIMENSIONAL FLOW, SETTING UP THE FINITE DIFFERENCE FORM; ORDERING SCHEMES; STANDARD ROW ORDERING; STANDARD COLUMN ORDERING; RESULTING MATRIX STRUCTURE; INTRODUCTION TO MULTI-PHASE FLOW THROUGH POROUS MEDIA.	Numerical Methods and Reservoir Simulation	PEN20418
-	STUDENTS AS GROUPS (OF 3 OR 4) ARE REQUESTED TO CARRY OUT A STUDY ON ONE OF THE PROBLEMS RELATED TO PETROLEUM ENGINEERING UNDER THE SUPERVISION OF ONE OF THE STAFF MEMBERS. EACH GROUP MUST SUBMIT A REPORT BEFORE THE END OF THE SECOND TERM. THE STUDENTS MUST GIVE A PRESENTATION OF THEIR WORK TO AN INTERVIEW COMMITTEE OF STAFF MEMBERS.	Engineering Project	PEN20419