Academic program description form

University name: Tikrit University

College/Institute: College of Education for Pure Sciences

Scientific Department: Department of Physics

Name of academic or professional program: Bachelor's degree

Name of final degree: Bachelor of Physics

Academic system: annual

Description preparation date: The beginning of the 2024-2025 academic year

Date of filling the file: 12/1/2025

Signature: Juff

Name of Department Head:

Assist. prof. Mohsen Hassan Ali

Date: 19 / 1/2024

Signatur

Name of Scientific Assistant:

Prof. Dr. Mohammad Ahmed Jassim

Date: 19 / 1/2024

Check the file by:

Quality Assurance and Performance Evaluation Division

Name of the Director of the Quality Assurance and Performance Evaluation Division:

Assist. Prof. Muammar Abdulaziz Kamel

Date: 1/19/2028

the signature

و منان الجودة وتقويم الادل

Professor Doctor

ALi Abdul Majeed Shihab

College of Education
for Pure Sciences

Authentication of the Dean

1. see the program

The Department of Physics aspires to be a leader in education and scientific research by preparing a generation of graduates capable of keeping pace with rapid developments in modern sciences and employing them in the service of society. The department focuses on providing students with a solid scientific foundation across various branches of physics, including mechanics, optics, electricity and magnetism, atomic and nuclear physics, quantum physics, solid-state physics, lasers, and electromagnetism.

2. Program message

The Department of Physics is committed to preparing qualified graduates who possess advanced scientific knowledge and outstanding research skills, enabling them to keep up with global developments in different branches of physics and related sciences. The department is keen to provide higher education based on modern scientific technologies and effective teaching methods, thereby enhancing students' experiences and preparing them to engage in various professional fields.

3. Program objective

- 1- Prepare specialized academic staff who can contribute to supplying educational institutions with highly qualified professionals.
- 2- Enable students to utilize their knowledge of physics in serving society and finding innovative scientific solutions.
- 3- Equip students with the pedagogical experience and skills necessary for excellence in the teaching profession.

Enhance students' awareness of the importance of physics and its vital role in various aspects of life and scientific development.

4. Program accreditation

Ministry of High Education and Scientific research

5. Other External Influences

6. Program Structure												
Program Structure	Number of	Study Unit	Percentage	Notice								
	Courses											
Enterprise requirements	5	12	7%	Essential								
College requirements	12	50	29%	Essential								
Department requirements	21	110	64%	Essential								
Summer training Other												

^{*} Notes may include whether the course is core or elective.

7.	Program	Description
. •		D COCI I D CI OII

Credi	t hours	Name of the course	Course	Year/level		
Practical	Theoretical		Code			
2	3	Electric and magnetic	ELP021	First		
	2	Heat and properties of matter	THP041	First		
	3	Mathematics	MAP031	First		
2	3	Mechanics	MEP011	First		
-	2	Arabic	Ar 017	First		
-	2	Calculators	C·۱٦	First		
-	1	Educational psychology	Psy 017 First			
-	2	Foundations of education	F 016	First		
-	1	Human rights and democracy	Hr٠١٣	First		
2	3	Electric and magnetic	ELP032	Second		
2	3	Optics	OPP012			
-	3	Mathematics	MAP022	Second		
-	2	Sound and wave motion	WMP042	Second		
-	2	astronomy	SSP052	Second		
-	2	psychology	Psy 017	Second		
-	2	Scientific research method	Srm • ١ °	Second		
-	2	Educational administration	Eda • ١ °	Second		
2	3	Electronics	ELP013 Third			
	3	Thermodynamics	THP033	Third		

2	3	Atomic and molecular	ATP023	Third
-	3	Analytical mechanics	AM P043	Third
-	2	Teaching methods	Tem • ١٨	Third
-	2	Counseling and mental health	Com 019	Third
-	3	Solid state	SOP024	Fourth
2	3	Nuclear	NUP014	Fourth
-	3	Quantum physics	QUP034	Fourth
-	2	Laser	LAP044	Fourth
-	3	Electromagnetic theories	EMR46	Fourth
-	2	View and apply	Va ٠١٩	Fourth
-	2	Measurement and evaluation	Me · ۱۸	Fourth

8. Expected learning outcom	ne of the programmer
Knowledge	
Cognitive Goals	1- Enabling students to know the importance of studying physics 2- Enabling students to know the historical role of Arab scientists in the field of physics 3-Enabling students to overcome the difficulties that hinder their studies 4- Enabling students to formulate observable and measurable cognitive and behavioral goals 5- Enabling students to know the importance of classroom activity and how to activate it in school life 6- Enabling students to know the impact of scientific knowledge of physics in developing intellectual aspects
Skills	
General and qualifying skill goals	1-Learning about modern teaching methods and methods 2-Knowing everything new in the field of physics to keep pace with the rapid development in this specialty 3- Holding scientific exhibitions, seminars and workshops
The program's skill objectives	 1- Teaching skill in physics 2- The student must have the ability to employ practical laboratory skills 3- The student must have the ability to link causes to causes

Values

Educational values	Continuous innovation and improvement. Competing in the education industry and adhering to standards of
	excellence.

9. Teaching and Learning strategies

- 1- The introductory method
- 2- Lecture method
- 3- Practical application in laboratories
- 4- Discussion and dialogue
- 5- Flipped learning

10. Evaluation methods

- 1- Weekly reports
- 2- Practical tests
- 3- Weekly, monthly and annual tests
- 4- Graduation research
- 5- Field visits

11. Faculty

Faculty members

Preparing staff	the Teaching		Specializ	ation		Scie
Lecturer	permanent	Requirements/ Skills (if any)	Private	General	name	ntif ic ran k
	✓		Nano Electronics	Physics sciences	Nadeem Khaled Hassan	prof
	√		Nuclear	Physics sciences	Asmaa Ahmed Aziz	prof
	√		Solid/Solid	Physics sciences	Abdullah Mahmoud Ali	prof
	√		Solid	Physics sciences	Niran Fadel Abdul- Jabbar's	prof
	√		Solid	Physics sciences	Adnan Raad Ahmed	prof
	√		Solid	Physics sciences	Khaled Hamdi Rezig	prof
	√		offspring	Physics sciences	Mohsen Hassan Ali	Assi st. Prof

	✓		Solid	Physics	Ayed	Assi
				sciences	Najm Saleh	st.
<u> </u>						Prof
	✓		solid/materials	Physics	Muammar	Assi
				sciences	Abdulaziz	st.
					Kamel	Prof
	✓		Solid	Physics	Hanan	Assi
				sciences	Reda Abdel	st.
					Ali	Prof
	✓		Nanotechnology	Physics	Qahtan	Assi
				sciences	Novan	st.
					Abdullah	Prof
	✓		Solid	Physics	Walaa	Assi
				sciences	Mahfouz	st.
					Muhammad	Prof
					Amin	
	✓		Solid	Physics	Rasha	Assi
				sciences	Hamed	st.
					Ahmed	Prof
	✓		Lasers and	Physics	Qasim	Assi
			molecular	sciences	Hammadi	st.
			spectra		Mahmoud	Prof
	✓		Solid	Physics	Ibrahim	Assi
				sciences	Khalaf	st.
				241	Salman	Prof
	✓		Solid	Physics	Planet	Assi
				sciences	David is	st.
					safe	Prof
	✓		Solid	Physics	Abbas	
				sciences	Kasoub	Teac
				221	Jarallah	her
	✓		Nanotechnology	Physics	Alaa Yusuf	Teac
			and renewable	sciences	Ali	her
			energies	501011112	1 111	1101
	✓		Solid	Physics	Hassan	Teac
			50114	sciences	Hamada	her
				Deletic	Ali	1101
	✓		Methods of	Physics	Ahmed	Teac
			teaching	sciences	Talab Sabar	her
			physics	D 01011	1 414.5	11.51
	✓		Solid	Physics	Shahad	Teac
i				sciences	Ahmed	her
					Dhiab	
	✓		Solid	Physics	Khaled	Teac
				sciences	Majoul	her
				22222	Turkish	
	✓		Solid	Physics	Ali Hussein	Teac
				sciences	Muhammad	her
	✓		Solid	Physics	Omar Adel	Teac
			50114	sciences	Jadaan	her
	✓		Solid	Physics	Safa Khalil	Assi
i			50114	sciences	Ibrahim	st.
<u> </u>		<u>l</u>		Deletic	101411111	5
1						

 T				
				Teac
				her
✓	Solid	Physics	Amna Raad	Assi
		sciences	Dahham	st.
				Teac
				her
✓	Nuclear	Physics	Hafsa Taha	Assi
		sciences	Ahmed	st.
				Teac
				her
✓	Solid	Physics	Alia	Assi
		sciences	Muhammad	st.
			Alwan	Teac
				her
✓	English	Physics	Roula	Assi
		sciences	Fawaz	st.
			Hammad	Teac
				her
✓	Solid	Physics	Mustafa	Assi
		sciences	Wathiq	st.
			Fathi	Teac
				her
✓	Nuclear	Physics	Rafid Sami	Assi
		sciences	Hamid	st.
				Teac
				her

Professional development

Orienting new Faculty members

New, visiting, full-time and other faculty members are guided by integrating them with experienced ones to provide them with the skills required in the teaching strategies approved within the educational program and continuous monitoring of the development of their cognitive level and the extent of their acquisition of the skills required for the scientific subject, in addition to the central courses that are held at the institution and college levels.

Professional development for Faculty members

The plan and arrangements for academic and professional development for faculty members include setting an annual plan for professional development, such as preparing an annual research plan for each teacher, as well as seminars, workshops, scientific courses, and activities that serve the community. It also includes developing a teaching and learning strategy through modern teaching methods such as brainstorming, group work, and the discussion and learning strategy. Discovery and inductive teaching strategy, To obtain learning results, their efficiency can be evaluated and measured through approved tests within the approved program.

The results of learning and professional development are evaluated through the evaluation of the

faculty member by the department head, as well as a questionnaire distributed to students in coordination with the Quality Division in the college and under the supervision of the Quality Department at the university.

12. Acceptance criterion

(Central admission)

13. The most important sources of information about the program

Ministry of High education and Scientific research

14. Program development plan

- 1- Forming committees in the scientific department whose mission is to follow up the program and conduct a comprehensive review and any developments that occur to it. .2
- 2- A questionnaire about students' opinions at the end of each semester about the academic program.
- 3- A questionnaire of faculty members' opinions at the end of each semester about the best ways to develop courses and teaching methods. .4
- 4- Coordination with the Quality Division at the university to follow up on the implementation of the academic program in the department
- 5- Conduct a comprehensive review of the program.

								Pro	grar	n Sk	ills (Chart			
Lea	rning	goute	come	s requ	uired	from	the p	orogr	am						
	Values skills K		K	Knowledge			Essential or optional	Name course	Course code	Year/level					
C4	C3	C2	C1	В4	В3	B2	B1	A4	A3	A2	A1				
*	*	*	*		*	*	*	*	*	*	*	Essential	Electric and magnetic	ELP021	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Heat and properties of matter	THP041	First
*	*	*	*		*	*	*	*	*	*	*	Essential	mathematics	MAP031	year
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Mechanics	MEP011	
*		*	*	*	*	*	*	*	*	*	*	Essential	Arabic	Ar٠١٧	
*	*	*		*	*	*	*	*	*	*	*	Essential	Calculators	C·IT	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Educational psychology	Psy · ۱۷	
*	* * * * * * *		*	Essential	Foundations of education	F 016									
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Human	Hr٠١٣	

												rights and democracy	
	*	*	*	*	*	*	*	*	*	*	Essential	English language	442EL

* Please check the boxes corresponding to the individual learning outcomes from the program being assessed

							Pro	gran	n Sk	ills (Chai	rt			
					Lear	ning o	outcoi	mes 1	requi	ired	from	the progra	ım		
	Val	ues			Ski	lls		Knowledge				Essential or optional	Name course	Course code	Year/le vel
C4	СЗ	C2	C1	B4	В3	B2	B1	A 4	A 3	A 2	A 1				
*	*	*	*		*	*	*	*	*	*	*	Essential	Electric and magnetic	ELP03 2	
*	*	*	*		*	*	*	*	*	*	*	Essential	Optics	OPP01 2	2nd /
*	*	*	*		*	*	*	*	*	*	*	Essential	mathematics	MAP02 2	year
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Sound and wave motion	WMP0 42	
*		*	*		*	*	*	*	*	*	*	Essential	astronomy	SSP05 2	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	psychology	Psy ⋅ \ ∀	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Scientific research method	Sci . ۱ °	
*	*		*	*	*	*	*	*	*	*	*	Essential	Educational administrati on	Ed · ۱ °	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	English language	443EL	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	The crimes of the Baath regime		

	Program Skills Chart														
	Learning outcomes required from the program														
	Val	ues			Skills		Knowledge		Essenti al or option al	Name course	Course code	Year/ level			
C4	С3	C2	C1	В4	В3	B2	B1	A 4	A 3	A 2	A 1				
*	*	*	*		*	*	*	*	*	*	*	Essential	Electronics	ELP013	
*	*	*	*		*	*	*	*	*	*	*	Essential	Thermodyn amics	THP033	3 rd /
*	*	*	*		*	*	*	*	*	*	*	Essential	Atomic and molecular	ATP023	year
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Analytical mechanics	AM P043	
*		*	*		*	*	*	*	*	*	*	Essential	Teaching methods	Tm · ۱۸	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Counseling and mental health	Cm 014	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	English	444EL	

						language	

	Program Skills Chart														
	Learning outcomes required from the program														
	Val	lues			Skills						ge	Essenti al or option	Name course	Course code	Year/le vel
												al			
C4	C3	C2	C1	В4	В3	B2	B1	A 4	A 3	A 2	A 1				
	*	*	*		*	*	*	*	*	*	*	Essenti al	Solid state	SOP024	
*	*	*	*		*	*	*	*	*	*	*	Essenti al	Nuclear	NUP014	4 th /yea
*	*	*	*		*	*	*	*	*	*	*	Essenti al	Quantum physics	QUP034	r
*	*	*	*		*	*	*	*	*	*	*	Essenti al	Laser	LAP044	
		*	*	*	*	*	*	*	*	*	*	Essenti al	Electroma gnetic theories	EMR46	
*	*	*	*		*	*	*	*	*	*	*	Essenti al	View and apply	Va٠١٩	
*	*	*	*		*	*	*	*	*	*	*	Essenti al	Measurem ent and evaluation	Me · ۱۸	
	*		*	*	*		*	*	*	*	*	Essenti al	English language	445EL	

Course description form

-Course Name
Iechanics / First Stage
-Course Code
Bsc
Ÿ-Semester / Year
• ٢ ٤/٢ • ٢٣
-Date of preparation of this description
• ٢٣/٣/٩
-Available forms of attendance

\mathbf{r}	• 1	
1)	21	T .7
$\boldsymbol{\nu}$	aı	L Y

6- Number of study hours (total) / Number of units (total)

60 hours

7- Name of the course supervisor (if more than one name is mentioned

Assistant Professor Dr.muaamar A.kamil

muaamar.a.kamil@tu.edu.iq

∧ -Course objectives

Objectives of the study subject

- Identify the types of motion.
- Study the motion of projectiles, falling objects and planets.
- Study the types and direction of forces.
- Study the types of torques applied to objects.
- Study the effect of terrestrial and linear acceleration on the motion of objects.
- Motion of fluids.
- Waves and wave motion

9- Teaching and learning strategies

Lecture style, discussing with students, and asking and exchanging questions with students

Strategy

1. -Course structure

-Course str		1			
Week	Hours	Name of the	Required	Learning	Evaluation
		unit or topic	learning	method	method
		unit of topic	O	method	memou
			outcomes		
First	٣	Physical	Basic concepts	Lecture	Daily and
		quantities			monthly exams,
					assignments and
					reporting
Second	٣	International	Basic concepts	Lecture	Daily and
		System of			monthly exams,
		Units			assignments and
					reporting
Third	٣	Arithmetic	How to deal	Lecture	Daily and
		operations on	with		monthly exams,
		vectors	directional		assignments and
			quantities		reporting
Fourth	٣	Finding the	Getting to	Lecture	Daily and

		unit matrix	know matrices		monthly overs
			know matrices		monthly exams,
		and			assignments and
		mathematical			reporting
F:64L	٣	operations	D	T4	D.:11
Fifth	1	equations of	Recognizing	Lecture	Daily and
		motion	regular		monthly exams,
			motion		assignments and
G: 41	٣	D ((')	D	т ,	reporting
Sixth	7	Rotational	Recognizing	Lecture	Daily and
		motion	rotational		monthly exams,
		equations	motion		assignments and
6 41	٣	T 4 4	E: 1 441	Т 4	reporting
Seventh	1	Instantaneous	Find out the	Lecture	Daily and
		and	instantaneous		monthly exams,
		instantaneous	speed		assignments and
		velocity			reporting
T: 14	<u> </u>	equations	3.6	Ŧ.,	D '1 1
Eighth	٣	Motion in a	Movement	Lecture	Daily and
		straight line			monthly exams,
					assignments and
3 .7• (1	٣	D (() 1	3.4		reporting
Ninth	٢	Rotational	Movement	Lecture	Daily and
		motion			monthly exams,
					assignments and
TD 41	٣	6 6 11		Ŧ.,	reporting
Tenth	٢	free fall	One-way	Lecture	Daily and
			movement		monthly exams,
					assignments and
E1 41	٣	D ' 4'1	N/ ·	Т 4	reporting
Eleventh	1	Projectiles	Movement in	Lecture	Daily and
			a plane		monthly exams,
					assignments and
T 161	٣	D I 4'	N/ ·	Т 4	reporting
Twelfth	1	Relative	Movement in	Lecture	Daily and
		velocity	a plane		monthly exams,
					assignments and
Th:44b	٣	Newton's first	M	T4	reporting
Thirteenth	1		Moving	Lecture	Daily and
		law	objects		monthly exams,
					assignments and
Fauntaanth	٣	Newton's	Maxing	Lastuna	reporting
Fourteenth	,	second law	Moving	Lecture	Daily and
		Second law	objects		monthly exams, assignments and
					_
Fifteenth	٣	Newton's third	Moving	Lecture	reporting Daily and
rinteentii	,	law	objects	Lecture	monthly exams,
		iaw	objects		assignments and
Sixteenth	٣	Static and	Logitimata	Lecture	reporting
Sixteenth	1	static and static friction	Legitimate friction	Lecture	Daily and
		static iffetion	iricuon		monthly exams,
					assignments and
					reporting

Seventeenth	٣	Constant force	Work and	Lecture	Daily and
Seventeenth	,	work		Lecture	monthly exams,
		WULK	energy		assignments and
					_
Fightoonth	٣	variable	Work and	Lastura	reporting
Eighteenth	,			Lecture	Daily and
		power work	energy		monthly exams,
					assignments and
NT: (٣	D ()	***	T .	reporting
Nineteenth	,	Restoring	Work and	Lecture	Daily and
		force and	energy		monthly exams,
		spring			assignments and
		constant			reporting
		calculation			
Twentieth	٣	Center of	Motion of a	Lecture	Daily and
1 wentieth	,	mass of a	system of	Lecture	monthly exams,
		particle and	particles		assignments and
		two point	particies		reporting
		particles			reporting
Twenty-one	٣	Principle of	Motion of a	Lecture	Daily and
I Wester		conservation	system of		monthly exams,
		of linear	particles		assignments and
		momentum	P		reporting
Twenty-Two	٣	Elastic and	Collisions	Lecture	Daily and
		inelastic			monthly exams,
		collision			assignments and
					reporting
Twenty-Three	٣	Collisions in	Collisions	Lecture	Daily and
v		the			monthly exams,
		Rutherford			assignments and
		plane and			reporting
		scattering			
Twenty-Four	٣	angular	Rotational	Lecture	Daily and
		velocity	motion		monthly exams,
					assignments and
					reporting
Twenty-Five	٣	The	Rotational	Lecture	Daily and
		relationship	motion		monthly exams,
		between			assignments and
		rotational and			reporting
		translational			
		motion			
Twenty-Six	٣	Simple	Vibrational	Lecture	Daily and
		vibrational	motion		monthly exams,
		motion			assignments and
T		equations	T • • • •	.	reporting
Twenty-Seven	٣	Flexibility and	Liquids	Lecture	Daily and
		density			monthly exams,
					assignments and
75			т	T .	reporting
Twenty-eight	٣	Pressure and	Liquids	Lecture	Daily and
		Archimedes'			monthly exams,

		Principle			assignments and
					reporting
Twenty-nine	٣	Wave motion	Waves	Lecture	Daily and
					monthly exams,
					assignments and
					reporting
Thirty	٣	Thermal	the heat	Lecture	Daily and
		equilibrium			monthly exams,
		and its			assignments and
		equations			reporting

11-Course Evaluation Daily exams score: 5, Homework and reports score: 10, Monthly exams score: 35 Final exam score: 50				
\Y-Learning and teaching resources				
Required textbooks (methodology if	Mechanics for primary grades			
available)				
Main References (Sources)	muhammad Qaysarun Mirza / 200			
Recommended supporting books and	References and reports on the web page			
references (scientific journals, reports				

Course description form

1- Course name
Electric/first class
2- Course code / ATP023
Bachelor's
3- Semester / year
7.75/7.78
4- Date this description was prepared
7.74/9/4
5- Available attendance forms
Day
6- Number of study hours (total) / number of units (total)
90 hour
7- Name of the course administrator (if more than one name is mentioned)

Name:- Assist. Prof. Dr:- H	anan Ridha , Email:- <u>dr.hanan.ridha@tu.edu.iq</u>
8- Course objectives	
Objectives of the study	Study the charge and material
subject	The meaning of the law of the electric field
· ·	Causs law
	The meaning of electric potential
	The law of capacitance
	The insolaters and its properties
	The properties of current and resestance
9- Teaching and learning str	rategies
Strategy	Lecture style, discussing with students, and asking
	and exchanging questions with students

10- Course Structure

Week	Hours	Name of	Required learning	Learnin	Evaluatio
		the unit or	outcomes	g	n method
		topic		method	
First	3	Basic	Structural material	Lecture	Daily and
		concepts			monthly
					exams,
					assignments
					and
					reporting
Second	3	Basic	The charge and material	Lecture	Daily and
		concepts			monthly
					exams,
					assignments
					and
	_		_		reporting
Third	3	The know	charge	Lecture	Daily and
		kind of the			monthly
		charge			exams,
					assignments
					and
T. 41	2	TDI I C		T 4	reporting
Fourth	3	The know of	Semiconductors, conductor	Lecture	Daily and
		the kind of	s and insoulater		monthly
		material			exams,
					assignments and
Fifth	3	The know of	The movment equations	Lecture	reporting Daily and
1,11(11		the regular	I he moviment equations	Lecture	monthly
		movment			exams,
		movinciit			assignments
					assignments
					reporting
Sixth	3	Coulums	Coulums law	Lecture	Daily and
SIATH		Coulding	Coalums 1011	Letture	Dully alla

		law			monthly
		14 **			exams,
					assignments
					assignments
					reporting
Seventh	3	Know of the	Charge current	Lecture	
Seventin	3	units of the	Charge,current	Lecture	Daily and
		mesurments			monthly
		mesurments			exams,
					assignments and
Fiab4b	3	The electric	Electric field	Lecture	reporting
Eighth	3		Electric field	Lecture	Daily and
		field			monthly
					exams,
					assignments
					and
N1: 41				T 4	reporting
Ninth	3	Electric	Electric field intensity	Lecture	Daily and
		field			monthly
		intensity			exams,
					assignments
					and
- · ·					reporting
Tenth	3	Point	Point charge	Lecture	Daily and
		charge			monthly
					exams,
					assignments
					and
					reporting
Eleventh	3	Continuos	Continuos surface	Lecture	Daily and
		surface			monthly
					exams,
					assignments
					and
					reporting
Twelfth	3	The solution	Excersice solution	Lecture	Daily and
		of the			monthly
		excersice			exams,
					assignments
					and
					reporting
Thirteenth	3	capacetance	capacetances	Lecture	Daily and
		S			monthly
					exams,
					assignments
					and
					reporting
Fourteenth	3	kind of the	Kind of the capacetance	Lecture	Daily and
		capacetance			monthly
					exams,
					assignments
					and
		1			reporting

Fifteenth	3	Double	Double panel of	Lecture	Daily and
rinteentii	3	panel of	capacetance	Lecture	monthly
		-	capacetance		•
		capacetance			exams,
					assignments
					and
G					reporting
Sixteenth	3	Spherical	Spherical capacetance	Lecture	Daily and
		capacetance			monthly
					exams,
					assignments
					and
					reporting
Seventeenth	3	Cylindrical	Cylindrical capacetance	Lecture	Daily and
		capacetance			monthly
					exams,
					assignments
					and
					reporting
Eighteenth	3	System	System partical movment	Lecture	Daily and
		partical	J I		monthly
		movment			exams,
		1110 (1110110			assignments
					and
					reporting
Nineteenth	3	the factors	Factors effect on the	Lecture	Daily and
Mictechtii	3	effecting on	capacetance	Lecture	monthly
		the	capacetanec		exams,
		capacetance			assignments
		Сарасстансс			and
					reporting
Twentieth	3	Connecting	Connecting of the	Lecture	Daily and
1 wentieth	3	of the		Lecture	•
			capacetance		monthly
		capacetance			exams,
					assignments
					and
TED .					reporting
Twenty-one	3	Electrical	Electrical energy	Lecture	Daily and
		energy			monthly
					exams,
					assignments
					and
					reporting
Twenty-	3	insulators	insulators	Lecture	Daily and
Two					monthly
					exams,
					assignments
					and
					reporting
Twenty-	3	Properties	Properties of the current	Lecture	Daily and
Three		of the	and resistance		monthly
		current and			exams,
		the			assignments
		resistance			and

					reporting
Twenty-	3	potential	potential	Lecture	Daily and
Four					monthly
					exams,
					assignments
					and
					reporting
Twenty-	3	Oums law	Oums law	Lecture	Daily and
Five					monthly
					exams,
					assignments
					and
					reporting
Twenty-Six	3	Dc current	Dc current	Lecture	Daily and
					monthly
					exams,
					assignments
					and
					reporting
Twenty-	3	Learn about	molecular physics and	Lecture	Daily and
nine		molecular	molecular bonds		monthly
		physics and			exams,
		molecular			assignments
		bonds			and
					reporting
Thirty 1	3	Knowledge	molecular spectra	Lecture	Daily and
		of molecular			monthly
		spectra			exams,
					assignments
					and
					reporting

11- Course Evaluation					
core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35 Final exam score: 50					
12- learning and Teaching Resources					
Required textbooks (methodology, if any)	The baises of the electric and maginatic				
Main references (sources)	No				
Recommended supporting books and	Nothing				
references (scientific journals, reports)					
Electronic references, Internet sites	General physics websites				

Course description form	
Course description form	1- Course nam
Course description form	
Course description form	Heat and properties of Matter / First stag
Course description form	Heat and properties of Matter / First stag 2- Course code / THP04
Course description form	Heat and properties of Matter / First stag 2- Course code / THP04 Bachelor 3- Semester / year
Course description form	1- Course nam Heat and properties of Matter / First stag 2- Course code / THP042 Bachelor' 3- Semester / year 2023-2024 4- Date this description was prepared

3-9-2023
5- Available attendance forms
Day
6- Number of study hours (total) / number of units (total
60 hour
he course administrator (if more than one name is mentioned)
st. Prof. Dr:- Rasha Hamid Ahmed , Email:- <u>rashahamed@tu.edu.i</u>
8- Course objective
he study subject 1- Learn about the laws of thermodynamics and
how to use them
2- Adding the laws of heat and heat conversion to solving problems and linking them to dail
lif
3- Developing thinking to understand states of
matter and how to transform matter from on state to anothe
4- Ability to solve energy and work problem
5- Obtaining knowledge to determine th
mechanical properties of materials, whice enables students to understand the environment
that surrounds them as well as deal wit
society
6- Understanding the magnetic properties of
materials and being able to benefit from then when dealing with materials in natur
9- Teaching and learning strategie
Strategy Lecture style, discussing with students, and askin
and exchanging questions with student

				10 Com	rse Structure
				10- Cou	rse Structure
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	2	Ch.1 / Temperature	The temperature - \\ scales Types of - \(\cdot \) thermometers.	Lecture	Daily and monthly exams, assignments and reporting
Second	2	Ch.1 / Temperature	Effect of -\(^\tau\) temperature changes. Thermal -\(^\tau\) expansion. Mechanism of -\(^\tau\) heat transfer	Lecture	Daily and monthly exams, assignments and reporting
Third	2	Ch.1 / Temperature	Low -7 temperatures Temperature -7 gradiant	Lecture	Daily and monthly exams, assignments and reporting
Fourth	2	Ch.2 / Heat and Phase Changes	Heat and its -\ effects Quantity of heat -\(^{\text{Y}}\)	Lecture	Daily and monthly exams, assignments and reporting
Fifth	2	Ch.2 / Heat and Phase Changes	Quantity of heat -\(^\text{Temperature}\) -\(^\text{Specific of heat}\) -\(^\text{omaterials}\)	Lecture	Daily and monthly exams, assignments and reporting
Sixth	2	Ch.2 / Heat	The Specific of -7	Lecture	Daily and

		and Phase	heat materials		monthly
					-
		Changes	measurement		exams,
			The mechanical -Y		assignments
			equivalent of		and reporting
			heat		
			Potential energy -^		
Seventh	2	Ch.2 / Heat	The state -9	Lecture	Daily and
		and Phase	transformation		monthly
		Changes	The first law of - \ .		exams,
			thermodynamics		assignments
			Application of -\\		and reporting
			first law		and reporting
			III St law		
Eighth	2	Ch.3 / The	The ideal and -	Lecture	Daily and
		Gases	real gases		monthly
		Cuscs	The kinetic -		exams,
			theory of gases		assignments
					and reporting
Ninth	2	Ch.3 / The	The gas law - "	Lecture	Daily and
		Gases	Boyls law - 2		monthly
		Jases	Charles law -°		•
					exams,
			The gas constant -7		assignments
					and reporting
Tenth	2	Ch.3 / The	The Potential -∀	Lecture	Daily and
		Gases	energy of gas		monthly
			Relation -A		exams,
			between Cp and		assignments
			Cv		and reporting
			CV		and reporting
Eleventh	2	Ch.4 / The	The density -	Lecture	Daily and
		Liquids	The pressure of -Y		monthly
		•	liquids		exams,
			•		assignments
					and reporting
					and reporting
Twelfth	2	Ch.4 / The	The surface - "	Lecture	Daily and
		Liquids	tension		monthly
			The liquid - £		exams,
			surface		assignments
		1	341.400	1	433.6111161163
					and reporting
					and reporting
Thirteenth	2	Ch.4 / The	The capillarity -°	Lecture	and reporting Daily and

		Liquids	_Y		exams,
					assignments
					and reporting
Fourteenth	2	Ch.5 / The	Stress -1	Lecture	Daily and
		Mechanical	Strain -Y		monthly
		Properties of			exams,
		Materials			assignments
					and reporting
Fifteenth	2	Ch.5 / The	Elasticity - "	Lecture	Daily and
		Mechanical	Modulus of -ξ		monthly
		Properties of	Elasticity		exams,
		Materials			assignments
					and reporting
Sixteenth	2	Ch.5 / The	Youngs Modulus -°	Lecture	Daily and
		Mechanical	Poissons ratio -7		monthly
		Properties of			exams,
		Materials			assignments
					and reporting
Seventeenth	2	Ch.5 / The	Torsional -Y	Lecture	Daily and
		Mechanical	constant		monthly
		Properties of	Torsional Strain -A		exams,
		Materials			assignments
					and reporting
Eighteenth	2	Ch.6 / The	The magnetic -\	Lecture	Daily and
		Magnetic	moment of		monthly
		Properties of	electron		exams,
		Materials	The angular - Y		assignments
			momentum of		and reporting
			electron		
Nineteenth	2	Ch.6 / The	The relation - "	Lecture	Daily and
		Magnetic	between (M) and		monthly
		Properties of	(L)		exams,
		Materials	The magnetic - €		assignments
			susceptibility		and reporting
Twentieth	2	Ch.6 / The	Classification of -°	Lecture	Daily and
		Magnetic	magnetic		monthly
		Properties of	materials		exams,
		Materials	The diamagnetic -7		assignments
			materials		

			The -V paramagnetic materials The -A ferromagnetic materials The anti9 ferromagnetic materials The - V ferrimagnetic materials		and reporting
Twenty-one	2	Ch.6 / The Magnetic Properties of Materials	The magnetic - \ \ \ elements Magnetic - \ \ \ \ transition metals Magnetic rate - \ \ \ \ \ earth metals	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	2	Ch.7 / The Electrical Properties of Materials	The conductors -\ The -\(^{\tau}\) Semiconductors The insulators -\(^{\tau}\)	Lecture	Daily and monthly exams, assignments and reportin
Twenty- Three	2	Ch.7 / The Electrical Properties of Materials	Electrical - [£] resistivity The - ^o superconductivit y	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	2	Ch.7 / The Electrical Properties of Materials	Electric field -7 Capacitor -7	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	2	Ch.7 / The Electrical	Polarization -^ Dielectric -9	Lecture	Daily and monthly

Twenty-Six	2	Properties of Materials Ch.7 / The Electrical Properties of Materials	Dielectric - \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Lecture	exams, assignments and reporting Daily and monthly exams, assignments and reporting
Twenty- Seven	2	Ch.8 / The Plasma	The Plasma - \ Plasma - \ Production	Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	2	Ch.8 / The Plasma	Investigation of -\(^\text{T}\) Plasma Plasma and -\(^\text{2}\) magnetic field	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	2	Ch.8 / The Plasma	Confinement of -° Plasma	Lecture	Daily and monthly exams, assignments and reporting
Thirty	2	Ch.8 / The Plasma	The Earth - \(\) magnetic field and the solar Plasma	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 10, score for assignments and reports: 10, score for monthly exams: 30

Final exam score: 50

12- learning and Teaching Resources	
Required textbooks (methodology, if any)	Heat and properties of Matter / Dr. Kadhim
	Ahmed Mohammed
Main references (sources)	Materials Science/ Maty Naser
Recommended supporting books and	University Physics/ Raheem abd
references (scientific journals, reports)	
Electronic references, Internet sites	https://www.alfred-library.com

Course Description for Foundations of Education - First Year

1. Course Title:

Foundations of Education / First Year

2. Course Code:

Bachelor's Degree

3. Annual Schedule: 2023/2024

4. Preparation Date for This Description: 27/4/2023

5. Attendance Formats Available: In-person

6. Total Study Hours / Units:

Total hours: 2Total units: 4

7. Course Coordinator Name (if more than one, list all):

Name: Assistant Ahmed Taleb Sabar

Email: ahmed.s.m.o.j@tu.edu.iq

8. Course Objectives:

- Define education.

- Define Islamic-Arabic education.

- Recognize education in some ancient civilizations.
- Understand primitive education.
- 9. Teaching and Learning Strategies:
 - Lectures, student discussions, and question exchange.

10. Course Structure:

Week	Hours	Learning	Unit/Topic	Teaching	Assessment
		Outcomes		Method	Method
1	2	Understanding,	Historical	Lecture,	Daily and
		Analyzing,	overview of	Discussion	monthly
		Synthesizing	education		exams,
					assignments
2	2	Understanding,	Educational	Lecture,	Daily and
		Analyzing,	objectives	Discussion	monthly
		Synthesizing			exams,
					assignments
3	2	Understanding,	Primitive	Lecture,	Daily and
		Analyzing,	education	Discussion	monthly
		Synthesizing			exams,
					assignments
4	2	Understanding,	Features of	Lecture	Daily and
		Analyzing,	primitive		monthly
		Synthesizing	education		exams,
					assignments
5	2	Understanding,	Education in	Lecture,	Daily and
		Analyzing,	ancient	Discussion	monthly
		Synthesizing	Mesopotamia		exams,
					assignments
6	2	Understanding,	Chinese	Lecture,	Daily and
		Analyzing,	education	Discussion	monthly
		Synthesizing			exams,
					assignments
7	2	Understanding,	Education	Lecture,	Daily and
		Analyzing,	system in	Discussion	monthly
		Synthesizing	Sparta		exams,

					assignments
8	2	Understanding, Analyzing, Synthesizing	Athenian education	Lecture, Discussion	Daily and monthly exams, assignments
9	2	Understanding, Analyzing, Synthesizing	Greek education	Lecture, Discussion	Daily and monthly exams, assignments
10	2	Understanding, Analyzing, Synthesizing	Islamic- Arabic education	Lecture, Discussion	Daily and monthly exams, assignments
11	2	Understanding, Analyzing, Synthesizing	Stages of Islamic- Arabic education	Lecture, Discussion	Daily and monthly exams, assignments
12	2	Understanding, Analyzing, Synthesizing	Pre-Islamic education era	Lecture, Discussion	Daily and monthly exams, assignments
13	2	Understanding, Analyzing, Synthesizing	The era of Islam's emergence	Lecture, Discussion	Daily and monthly exams, assignments
14	2	Understanding, Analyzing, Synthesizing	Righteous Caliphs and Umayyad eras	Lecture, Discussion	Daily and monthly exams, assignments
15	2	Understanding, Analyzing, Synthesizing	Era of development and prosperity	Lecture, Discussion	Daily and monthly exams, assignments
16	2	Understanding, Analyzing, Synthesizing	Era of decline and dissolution	Lecture, Discussion	Daily and monthly exams, assignments
17	2	Understanding, Analyzing, Synthesizing	Prominent figures in Islamic- Arabic educational thought	Lecture, Discussion	Daily and monthly exams, assignments
18	2	Understanding, Analyzing, Synthesizing	Ibn Khaldun	Lecture, Discussion	Daily and monthly exams, assignments
19	2	Understanding, Analyzing, Synthesizing	Ibn Sina	Lecture, Discussion	Daily and monthly exams, assignments
20	2	Understanding, Analyzing, Synthesizing	Al-Ghazali	Lecture, Discussion	Daily and monthly exams,

					assignments
21	2	Understanding, Analyzing, Synthesizing	Western educational figures	Lecture, Discussion	Daily and monthly exams, assignments
22	2	Understanding, Analyzing, Synthesizing	Plato	Lecture, Discussion	Daily and monthly exams, assignments
23	2	Understanding, Analyzing, Synthesizing	Jean-Jacques Rousseau	Lecture, Discussion	Daily and monthly exams, assignments
24	2	Understanding, Analyzing, Synthesizing	Pestalozzi	Lecture, Discussion	Daily and monthly exams, assignments
25	2	Understanding, Analyzing, Synthesizing	John Dewey	Lecture, Discussion	Daily and monthly exams, assignments
26	2	Understanding, Analyzing, Synthesizing	Al-Ghazali	Lecture, Discussion	Daily and monthly exams, assignments
27	2	Understanding, Analyzing, Synthesizing	Relationship between education and society	Lecture, Discussion	Daily and monthly exams, assignments
28	2	Understanding, Analyzing, Synthesizing	Relationship between education and the environment	Lecture, Discussion	Daily and monthly exams, assignments
29	2	Understanding, Analyzing, Synthesizing	Moral education	Lecture, Discussion	Daily and monthly exams, assignments
30	2	Understanding, Analyzing, Synthesizing	Education and economic development	Lecture, Discussion	Daily and monthly exams, assignments

11. Course Evaluation:

- Monthly exam score: 50 - Final exam score: 50

12. Learning and Teaching Resources:

- Required textbooks (if applicable):

Foundations of Education for early grades.

- Main references (sources):

Al-Ibrashi, Mohammed Atiyah, *Jean-Jacques Rousseau: His Views on Education and Teaching*. Cairo: Dar Ihyaa Al-Kutub Al-Arabiya, 1951.
- Additional recommended references (scientific journals, reports, etc.): None.
نموذج وصف المقرر
1. Course Name:
English Language / First Stage
2. Course Code:
Undergraduate
3. Semester / Year:
2023- 2024
4. Description Preparation Date:
5/ 9/ 2023
5. Available Attendance Forms:
C. 11. MIMOIA 1 INCHAMILA I OTHIO

Daily						
6. Number of	6. Number of Credit Hours (Total) / Number of Units (Total)					
60 hours						
7. Course adm	ninistrator's name (mention all, if mor	e than one name)				
Name: Assist. Teacher: Rola Fawwaz Hammad Email: rula.f.hammad@tu.iq	<u>1.e</u>					
8. Course O	bjectives					
• learning the basics of English language □ studying some tenses □ studying some English styles • studying some physical terms						
9. Teaching	9. Teaching and Learning Strategies					
Strategy	Lecture style, discussing with students, and asking questions to students					
10. Course Structure						

Week	Hours	Required Learning	Unit or subject	Learning	Evaluation
		Outcomes	name	method	method
First	2	Learn what is the basics of English Language	Basics of English	Lecture	Quiz
Second	2	How and when this tense is used	Present continuous tense	Lecture	Monthly exam
Third	2	Training for reading	Reading	Lecture	Daily listening
Fourth	2	How and when this tense is used	Simple present tense	Lecture	Monthly& daily exam
Fifth	2	How this style is used	Zero conditional (If	Lecture	Monthly& daily exam

			clause)		
Sixth	2	How to use this style	Future passive	Lecture	Monthly& daily exam
Seventh	2	How to use this style	Present passive	Lecture	Monthly& daily exam
Eighth	2		First exam	Lecture	Monthly exam
Ninth	2	Knowing some physical terms	Terms	Lecture	Quiz
Tenth	2	Training for Speaking	Speaking	Lecture	Daily participants
Eleventh	2	Training for reading	Reading	Lecture	Daily participants
Twelfth	2	How to read decimal numbers	Reading decimals	Lecture	Monthly& daily exam
Thirteent h	2	How to read years	Reading years	Lecture	Monthly& daily exam
Fourteent h	2	Knowing the time	Telling the time	Lecture	Monthly& daily exam
Fifteenth	2	How to use this type of Answer	Short Answer	Lecture	Monthly& daily exam
Sixteenth	2		Second exam	Lecture	Monthly exam
Seventeen th	2	Training for writing	Story time	Lecture	Monthly& daily exam
Eighteent h	2	Knowing some definitions	Definitions	Lecture	Monthly& daily exam

Nineteent	2	How to use this style	Comparative	Lecture	Monthly&
h					daily exam
Twentieth	2	How to use this style	Superlative	Lecture	Monthly&
					daily exam
Twenty	2	Training for Reading	Reading	Lecture	Monthly&
first	_	Training for resuming	1100001112		daily exam
Twenty	2		Third Exam	Lecture	Monthly exam
second					
Twenty	2	Knowing the Meaning of	Physical terms	Lecture	Monthly&
third		some terms			daily exam
Twenty	2	Reinforcement students'	Vocabulary	Lecture	Monthly&
fourth		knowledge of vocabulary			daily exam
Twenty	2	Reinforcement students'	Synonyms	Lecture	Monthly&
fifth		knowledge			daily exam
Twenty	2	Reinforcement students'	Antonyms	Lecture	Monthly&
sixth		knowledge			daily exam
Twenty	2	Reinforcement students'	Matching	Lecture	Monthly&
seventh		knowledge			daily exam
Twenty	2	Knowing some English	Introduction	Lecture	Monthly&
eighth		styles of communication			daily exam

Twenty	2		Review	Lecture	
ninth					
Thirtieth	2	Students' Evaluation	Fourth Exam	Lecture	Monthly exam

Course description form

1- Course name
Mathematics
2- Course code
MAP031
3- Semester / year
2023-2024
4- Date this description was prepared
15/12/2023
5- Available attendance forms
weekly
6- Number of study hours (total) / number of units (total)

90 hour				
7- Name of the course administrator (if mor	re than one name is mentioned)			
Name:- Dr. Abbas Kasoob Jarallah , Email	:- <u>abbas.g.kasoob@tu.edu.iq</u>			
8- Course objectives				
Objectives of the study subject • Providing information to the student about the most important mathematical topics and their relationship to physics.				
9- Teaching and learning strategies				
Strategy	Using the face-to-face lecture method and giving students opportunities to discuss and solve daily and monthly questions and tests			

10- Course Structure

Week	Hours	Name of the unit	Required learning	Learning	Evaluation
***************************************	110415	or topic	outcomes	method	method
First	3	slope	Slope Intercept	Lecture	Daily and
		1	Form Definition		monthly
					exams,
					assignments
					and reporting
Second	3	slope	Slope between	Lecture	Daily and
		_	Two Points		monthly
					exams,
					assignments
					and reporting
Third	3	slope	Slope of Vertical	Lecture	Daily and
			Lin		monthly
			Slope of <u>parallel</u>		exams,
			<u>lines</u>		assignments
					and reporting
Fourth	3	slope	Formula for	Lecture	Daily and
			Distance between		monthly
			Two Points		exams,
					assignments
					and reporting
Fifth	3	slope	the angle between	Lecture	Daily and
			two lines		monthly
					exams,
					assignments
					and reporting
Sixth	3	slope	the angle between	Lecture	Daily and
			two lines		monthly
					exams,
					assignments
					and reporting
Seventh	3	slope	Examples for the	Lecture	Daily and
			chapter one		monthly
					exams,
					assignments
					and reporting

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Eighth	3	Trigonometric	Trigonometric	Lecture	Daily and
		Functions	Functions		monthly
					exams,
					assignments
					and reporting
Ninth	3	Trigonometric	Trigonometric	Lecture	Daily and
		Functions	Functions Values		monthly
					exams,
					assignments
					and reporting
Tenth	3	Trigonometric	Trigonometric	Lecture	Daily and
		Functions	Functions Values		monthly
					exams,
					assignments
					and reporting
Eleventh	3	Trigonometric	Sum and	Lecture	Daily and
		Functions	Difference		monthly
			Identities		exams,
					assignments
					and reporting
Twelfth	3	Trigonometric	Double Angle	Lecture	Daily and
		Functions	Identities		monthly
					exams,
					assignments
					and reporting
Thirteenth	3	Trigonometric	Triple Angle	Lecture	Daily and
	_	Functions	Identities		monthly
					exams,
					assignments
					and reporting
Fourteenth	3	Trigonometric	Product identities	Lecture	Daily and
1 our contin		Functions	1 Today Taching	Lecture	monthly
					exams,
					assignments
					and reporting
Fifteenth	3	Trigonometric	Examples for the	Lecture	Daily and
	_	Functions basics	chapter		monthly
			1		exams,
					assignments
					and reporting
Sixteenth	3	Chapter 2	Monthly test	Lecture	Daily and
	-				monthly
					exams,
					assignments
					and reporting
Seventeenth	3	The Exponential	The Exponential	Lecture	Daily and
	-	Function	Function		monthly
		1 611641011	1 should		exams,
					assignments
					and reporting
Eighteenth	3	The Exponential	- ·	Lecture	Daily and
Eighteenth	3	Function	Exponent Rules	Lecture	monthly
		1 unction	Chart and		_
					exams,

			examples		assignments
					and reporting
Nineteenth	3	The logarithmic	The logarithmic	Lecture	Daily and
		function	function		monthly
					exams,
					assignments
					and reporting
Twentieth	3	Example and	Examples for the	Lecture	Daily and
		questions	chapter		monthly
					exams,
					assignments
T		3.6 .11	N.C	.	and reporting
Twenty-one	3	Monthly test	Monthly test	Lecture	Daily and
					monthly
					exams,
					assignments
TE 4 TE		D : '.'	D : ::	T 4	and reporting
Twenty-Two	3	Derivatives	Derivatives	Lecture	Daily and
					monthly
					exams,
					assignments
Т	3	Derivatives	Differentiation of	T4	and reporting
Twenty- Three	3	Derivatives		Lecture	Daily and
Inree			Trigonometric Functions		monthly
			runctions		exams,
					assignments
Twenty-Four	3	Derivatives	The Product Rule	Lecture	and reporting Daily and
i wenty-roui	3	Derivatives	The Floduct Rule	Lecture	monthly
					exams,
					assignments
					and reporting
Twenty-Five	3	Derivatives	Examples for the	Lecture	Daily and
1 westey 11ve		Benvanves	chapter	Lecture	monthly
			on prof		exams,
					assignments
					and reporting
Twenty-Six	3	Integration	Integration Rule	Lecture	Daily and
•					monthly
					exams,
					assignments
					and reporting
Twenty-	3	Integration	double integral	Lecture	Daily and
Seven					monthly
					exams,
					assignments
					and reporting
Twenty-eight	3	Integration	Triple Integral	Lecture	Daily and
					monthly
					exams,
					assignments
					and reporting

Twenty-nine	3	Integration	Examples for the	Lecture	Daily and
			chapter		monthly
					exams,
					assignments
					and reporting
Thirty	3	Integration	Monthly test	Lecture	Daily and
					monthly
					exams,
					assignments
					and reporting

11- Course Evaluation	
core for daily exams: 5, score for assignments a Final exam score: 50	nd reports: 10, score for monthly exams: 35
12- learning and Teaching Resources	
Required textbooks (methodology, if any)	Differential and integral calculus N.Piskunov
Main references (sources)	Calculus Basics by Khaled Qasim Samou, Calculus Theory by Freddie
Recommended supporting books and references (scientific journals, reports)	Nothing
Electronic references, Internet sites	General physics websites, Shum series in mathematics

1- Course name
Electricity / n ^{2d} stage
2- Course code / ELP 032
3- Semester / year
2023/2024
4- Date this description was prepared
3/9/2023

5- Available attendance forms

Day

6- Number of study hours (total) / number of units (total)

60 hour

7- Name of the course administrator (if more than one name is mentioned)

Name: Prof. dr.: Adnan R. Ahmed , Email:- amazonq797@tu.edu.iq

8- Course objectives

Objectives of the study subject

Electricity & magnetism

Force on an charge moving in a magnetic field

- Study the conservation and its applications .
- Studying of attractive and its Law
- Studying Gauss surfaces
- Study the columns law.
- studying the point charge.
- studying the Faraday's law .

Bayo s –savert law

Application of bayots savert law

9- Teaching and learning strategies

Strategy

Lecture style, discussing with students, and asking and exchanging questions with students

10- Course Su	ucture				
Week	Hours	Name of the	Required	Learning	Evaluation
		unit or topic	learning	method	method
		•	outcomes		
First	2	Magnetic field		Lecture	Daily and
		S			monthly
					exams,
					assignments
					and reporting
Second	2	Magnetic flux		Lecture	Daily and
					monthly
					exams,
					assignments
					and reporting
Third	2	Force on an charge		Lecture	Daily and
		moving in a			monthly
		magnetic field			exams,
					assignments
					and reporting
Fourth	2	First Exam		Lecture	Daily and
					monthly
					exams,
					assignments

				and reporting
Fifth	2	Movement of an	Lecture	Daily and
		electrically		monthly
		charged particle in		exams,
		a magnetic field		assignments
				and reporting
Sixth	2	Thomson's	Lecture	Daily and
		experiment to		monthly
		measure the ratio		exams,
		of electron charge		assignments
		to it mass		and reporting
Seventh	2	Hall effect	Lecture	Daily and
				monthly
				exams,
				assignments
				and reporting
Eighth	2	The force on	Lecture	Daily and
Eighth	2	conductor in	Lecture	monthly
		which an electric		exams,
		current in a		assignments
				_
Ninth	2	magnetic field	Lastura	and reporting
Nilltii	L	Torque on a coil	Lecture	Daily and
		through which an		monthly
		electric current in		exams,
		a magnetic passes		assignments
7 5 (1)		G I F	T (and reporting
Tenth	2	Second Exam	Lecture	Daily and
				monthly
				exams,
				assignments
				and reporting
Eleventh	2	Movement coil	Lecture	Daily and
		galvanometer		monthly
				exams,
				assignments
				and reporting
Twelfth	2	Bayo s –savert law	Lecture	Daily and
		Application of		monthly
		bayots savert law		exams,
		Magnetic		assignments
		induction of a		and reporting
		moving electric		
		change		
Thirteenth	2	The force between	Lecture	Daily and
		two long parallel		monthly
		straight wires,		exams,
		each of which is		assignments
		electric current		and reporting
		Law of the -		
		amper		
		circle		
		Applications of		
		law of the amper		

		circle		
Fourteenth	2	third Exam	Lecture	Daily and monthly exams, assignments and reporting
Fifteenth	2	Electric induced force thrust Fara day's law Measure B by using search coil Fara day's disc Electric generator	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	2	Mutual induction Self-induction Energy stored in the magnetic field Magnetic energy density Linking inductors Electrical transformer	Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	2	The current Power in Ac circuits The effective value of the alternating current and alternating voltage Voltage difference direction chart Resounds	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	2	Four examination	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	2	Magnetic field	Lecture	Daily and monthly exams, assignments and reporting
Twentieth	2	Magnetic flux	Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	2	Force on an charge moving in a magnetic field	Lecture	Daily and monthly exams, assignments

				and reporting
Twenty-Two	2	First Exam	Lecture	Daily and
-				monthly
				exams,
				assignments
				and reporting
Twenty-Three	2	Movement of an	Lecture	Daily and
		electrically		monthly
		charged particle in		exams,
		a magnetic field		assignments
				and reporting
Twenty-Four	2	Thomson's	Lecture	Daily and
		experiment to		monthly
		measure the ratio		exams,
		of electron charge		assignments
		to it mass		and reporting
Twenty-Five	2	Hall effect	Lecture	Daily and
•				monthly
				exams,
				assignments
				and reporting
Twenty-Six	2	The force on	Lecture	Daily and
		conductor in		monthly
		which an electric		exams,
		current in a		assignments
		magnetic field		and reporting
Twenty-Seven	2	Torque on a coil	Lecture	Daily and
		through which an		monthly
		electric current in		exams,
		a magnetic passes		assignments
				and reporting
Twenty-eight	2	Second Exam	Lecture	Daily and
				monthly
				exams,
				assignments
				and reporting
Twenty-nine	2	Movement coil	Lecture	Daily and
		galvanometer		monthly
				exams,
				assignments
				and reporting
Thirty 1	2	Bayo s –savert law	Lecture	Daily and
		Application of		monthly
		bayots savert law		exams,
		Magnetic		assignments
		induction of a		and reporting
		moving electric		
		change		

11- Course Evaluation	
core for daily exams: 5, score for assignments a Final exam score: 50	and reports: 10, score for monthly exams: 35
12- learning and Teaching Resources	
Required textbooks (methodology, if any)	
Main references (sources)	Electricity and magnetism
Recommended supporting books and	Nothing
references (scientific journals, reports)	
Electronic references, Internet sites	

Sound and wave motion / Second stage 2- Course code / ATP023 Bachelor's 3- Semester / year
Bachelor's
3- Semester / year
7.75/7.7
4- Date this description was prepared
Y . Y W/9/W
5- Available attendance forms

Day

6- Number of study hours (total) / number of units (total)

60 hour

7- Name of the course administrator (if more than one name is mentioned)
Name:- Prof. Dr:- Nadim Khalid Hassan , Email:- nadimkh4@tu.edu.iq

8- Course objectives

- . Understanding basic concepts in wave motion.
- . Studying free Oscillation.
- .Study of superposition of simple harmonic motions.
- .Investigating damped Oscillation.
- .Exploring forced Oscillation.
- .Studying transverse waves in one dimension.
- .Studying longitudinal waves (sound waves).
- .General considerations in sound and wave phenomena.

9- Teaching and learning strategies

Strategy

The lecture style, discussing students, asking and circulating questions with students

Week	Hour s	Name of the unit or topic	Required learning	Learning method	Evaluation method
			outcomes		
First	۲	Sound and wave	Basic concepts	Lecture	Daily and
		motion			monthly
					exams,
					assignments
					and reporting
Second	۲	Sound and wave	Types of	Lecture	Daily and
		motion	Mechanical Wave		monthly
			Motion		exams,
					assignments
					and reporting
Third	۲	Free Oscillation		Lecture	Daily and
			Equation of		monthly
			Simple Harmonic		exams,
			Motion		assignments
					and reporting
Fourth	۲	Free Oscillation		Lecture	Daily and
			Energy of the		monthly
			Simple Harmonic		exams,

T			Oscillator		assignments
			Oscillator		_
Fifth	۲	Free Oscillation	Applications of	Lostwa	and reporting
FIITN	,	Free Oscillation	Applications of	Lecture	Daily and
			Simple Harmonic Motion		monthly
			Motion		exams,
					assignments
					and reporting
Sixth	4	Superposition of	Principle of	Lecture	Daily and
		Simple Harmonic	Superposition		monthly
		Motions –			exams,
					assignments
					and reporting
Seventh	۲	Superposition of	Superposition	Lecture	Daily and
		Simple Harmonic	Two Simple		monthly
		Motions –	Harmonic		exams,
			Motions		assignments
					and reporting
Eighth	۲	Superposition of	Graphical	Lecture	Daily and
8		Simple Harmonic	Method for		monthly
		Motions –	Superposition		exams,
			Two		assignments
			Perpendicular		and reporting
			Simple		and reporting
			Harmonic Harmonic		
			Motions		
Ninth	۲	Damped Oscillation	The Force	Lecture	Daily and
MIII	,	Damped Oscillation	Causing	Lecture	monthly
					_
			Damped Oscillation		exams,
			Oscillation		assignments
					and reporting
Tenth	۲	Damped Oscillation	Equation of	Lecture	Daily and
Tenen		Damped Osemation	Damped Damped	Lecture	monthly
			Harmonic		exams,
			Motion		assignments
			MUUUII		and reporting
Florronth	۲	Damped Oscillation	Colution of the	Lastures	
Eleventh	,	Damped Oscillation	Solution of the	Lecture	Daily and
			Damped		monthly
			Harmonic		exams,
			Motion		assignments
TD 18.3	٠	T 10 m 1	Equation	.	and reporting
Twelfth	4	Forced Oscillation	Solution of the	Lecture	Daily and
			Forced Motion		monthly
			Equation		exams,
					assignments
					and reporting
		Forced Oscillation	Resonance and	Lecture	Daily and
Thirteenth	۲	1 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			
Thirteenth	۲		Amplitude of		monthly
Thirteenth	4	201000 00000000	Amplitude of Oscillation at		monthly exams,
Thirteenth	*	201000 00000000	_		exams,
Thirteenth	*		Oscillation at		exams, assignments
Thirteenth Fourteenth	Y	Forced Oscillation	Oscillation at	Lecture	exams,

1		1	D.4		
			Between		exams,
			Resonance		assignments
			Frequency and		and reporting
			the Natural		
			Frequencies of		
Ties d		TE XXI	the Oscillator	T	D '1 1
Fifteenth	۲	Transverse Waves	Transverse	Lecture	Daily and
		in One Dimension	Wave Motion		monthly
			in One		exams,
			Dimension		assignments
G: 4 1	۲	TD XX	E 6	T	and reporting
Sixteenth	7	Transverse Waves	Equation of	Lecture	Daily and
		in One Dimension	Transverse		monthly
			Wave Motion		exams,
			in a Oscillating		assignments
C 4 4		TD XX	String	T	and reporting
Seventeenth	۲	Transverse Waves	Standing	Lecture	Daily and
		in One Dimension	Waves, Free		monthly
			Oscillation of a		exams,
			Stretched and		assignments
			Finite-Length		and reporting
			String, and the		
T: 14 (1		TD XXI	Sonometer	T (D '1 1
Eighteenth	۲	Transverse Waves	Laws of	Lecture	Daily and
		in One Dimension	Oscillating		monthly
			Strings		exams,
					assignments
NT: 4 A		T '4 1' 1	T 4 1 1	т .	and reporting
Nineteenth	۲	Longitudinal	Longitudinal	Lecture	Daily and
		Waves (Sound	Waves in a		monthly
		Waves)	Metal Rod and		exams,
			a Column of		assignments
TD 41 41	۲	T '4 1' 1	Fluid	Τ 4	and reporting
Twentieth	1	Longitudinal	Equation of the	Lecture	Daily and
		Waves (Sound	Sound Wave in		monthly
		Waves)	Terms of		exams,
			Pressure		assignments
Tyyorday	۲	Longitudia - 1	C4a d!	I c c4	and reporting
Twenty-one	,	Longitudinal	Standing Longitudinal	Lecture	Daily and
		Waves (Sound	Longitudinal Waves in		monthly
		Waves)			exams,
			Resonance Tubes		assignments
Towarder Towa	۲	Cound and the		Tastana	and reporting
Twenty-Two	,	Sound and the	Pitch,	Lecture	Daily and
		Wave Phenomenon	Loudness,		monthly
			Timbre, Pure		exams,
			(or Inaudible)		assignments
			Sounds		and reporting
Twenty-Three	۲	Sound and the	Docibal Saala	Lecture	Daily and
i wenty-i firee	,	Wave Phenomenon	Decibel Scale, Noise or	Lecture	Daily and
		wave r nenomenon			monthly
			Disturbance		exams,
					assignments

					and reporting
Twenty-Four	۲	Sound and the	Factors	Lecture	Daily and
-		Wave Phenomenon	Affecting the		monthly
			Speed of Sound		exams,
			Waves in Air		assignments
					and reporting
Twenty-Five	۲	Sound and the	Properties of	Lecture	Daily and
		Wave Phenomenon	Sound Waves		monthly
					exams,
					assignments
					and reporting
Twenty-Six	۲	Sound and the	Doppler Effect	Lecture	Daily and
		Wave Phenomenon			monthly
					exams,
					assignments
					and reporting
Twenty-Seven	۲	Ultrasonic Waves	Mechanism of	Lecture	Daily and
		and Their	Generation of		monthly
		Applications	Ultrasonic		exams,
			Waves		assignments
			Components of		and reporting
			an Ultrasonic		
			Wave Device		
Twenty-eight	۲	Ultrasonic Waves	Effect of	Lecture	Daily and
		and Their	Ultrasonic		monthly
		Applications	Waves on		exams,
			Biological Cells		assignments
					and reporting
Twenty-nine	۲	Ultrasonic Waves	Behavior of	Lecture	Daily and
		and Their	Ultrasonic		monthly
		Applications	Waves in the		exams,
			Human Body		assignments
			~	<u>.</u>	and reporting
Thirty	۲	Ultrasonic Waves	Some	Lecture	Daily and
		and Their	Applications of		monthly
		Applications	Ultrasonic		exams,
			Waves		assignments
					and reporting

11- Course Evaluation	
core for daily exams: 5, score for assignments ar Final exam score: 50	nd reports: 10, score for monthly exams: 35
12- learning and Teaching Resources	
Required textbooks (methodology, if any)	Sound and Wave Motion Physics
	Amjad Gorgeah
Main references (sources)	1. Mechanics and Properties of Matter,
	By: Kohle
	2. Acoustics , Shom Series
Recommended supporting books and	Nothing
references (scientific journals, reports)	

Electronic references, I	nternet sites	General phys	sics websites	
	Connec descrip	t'an farm		
	Course descrip	tion form		
1- Course name	Course descrip	tion form		
Optics / n ^{2d} stage		tion form		
		tion form		
Optics / n ^{2d} stage 2- Course code / OPP		tion form		
Optics / n ^{2d} stage		tion form		
Optics / n ^{2d} stage 2- Course code / OPP		tion form		
Optics / n ^{2d} stage 2- Course code / OPP 3- Semester / year 2023/2024	012	tion form		
Optics / n ^{2d} stage 2- Course code / OPP 3- Semester / year	012	tion form		
Optics / n ^{2d} stage 2- Course code / OPP 3- Semester / year 2023/2024 4- Date this description	012 was prepared	tion form		

Day

6- Number of study hours (total) / number of units (total)

90 hour

7- Name of the course administrator (if more than one name is mentioned)

Name: Prof. dr.: Abdullah M. Ali , Email:- abdullah.ma1763@tu.edu.iq

8- Course objectives

Objectives of the study subject

The nature of light & Electromagnetic spectrum

- Study the Refraction Reflection phenomena.
- Studying the lens & and its laws controlled on that.
- Studying the mirrors and its laws controlled on that.
- Study the aberration monochromatic, spherical.
- studying the diffraction &polarization.
- studying the interference.

9- Teaching and learning strategies

Strategy

Lecture style, discussing with students, and asking and exchanging questions with students

10- Course Sti					
Week	Hours	Name of the	Required	Learning	Evaluation
		unit or topic	learning	method	method
		diff of topic		method	memou
			outcomes		
First	3	THE NATURE		Lecture	Daily and
		AND			monthly
		PROPAGATION			exams,
		OF LIGHT			assignments
		The nature of Light			and reporting
		, wave from and			
		rays, Index of			
		refraction, The			
		electromagnetic			
		Spectrum,			
		problems .			
Second	3	REFLECTION		Lecture	Daily and
		AND REFRA			monthly
		CTION			exams,
		Reflection and			assignments
		refraction at plane			and reporting
		surface, the laws of			1 8
		reflection and			
		refraction, Ray			

		tua atua aut a £	I	
		treatment of reflection and refraction, the principle of Reversibility, Fermats principle, problems.		
Third	3	SPHERICAL SURFACES Focal points and Focal lengths, Image formation, Virtual Images, conjugate points and planes, Convention of signs, Graphical constructions, the parallel Ray method, Oblique – Ray methods, Magnification, Reduced vergence, Derivation of Gaussian Formula, problems.	Lecture	Daily and monthly exams, assignments and reporting
Fourth	3	First Exam	Lecture	Daily and monthly exams, assignments and reporting
Fifth	3	LENSES Thin lenses, focal points and focal lengths, Image Formation, Conjugates points and planes, the parallel –Ray method, The oblique- Ray method Use of lens formula, Lateral Magnification, virtual Images, Lens Markers formula, Thin – Lens combinations, the power of a thin Lens, Derivation of the Lens Makers	Lecture	Daily and monthly exams, assignments and reporting

Sixth	3	formula. Thick Lenes, Two spherical surfaces, Focal points and principal points ,Generel thick – Lens Formula SPHERICAL MIRRORS Focal point and Focal Length, Graphical construction's, Mirror Formulas, power of Mirrors, Thick mirrors, Thick mirrors Formulas, other thick Mirrors , problems	Lecture	Daily and monthly exams, assignments and reporting
Seventh	3	A BERRIONS OF LENSES AND MIRRORS A berrations, Spherical aberration of a lens, Spherical aberration of Mirrors, coma, Astigmatism ,curvature of field, kinds of aberration.	Lecture	Daily and monthly exams, assignments and reporting
Eighth	3	Second Exam	Lecture	Daily and monthly exams, assignments and reporting
Ninth	3	OPTICAL INSTRUMENTS The eye, Defects of vision, Spectacle, the simple microscope Magnifier, Refracting telescopes, Normal magnification, the reflecting telescope, camera, stops, the rangefinder, problems.	Lecture	Daily and monthly exams, assignments and reporting

Tenth	3	INTERFERENCE	Lecture	Daily and
				monthly
		Huygen's principle,		exams,
		Young's Experiment, Interference		assignments
		Fringes from a		and reporting
		Double source,		
		Intensity		
		Distribution in the		
		fringe system,		
		Coherent sources,		
		Division of		
		Amplitude.		
		Fringes of Equal		
		Inclination,		
		Newton's Rings,		
		problems.		
Eleventh	3	DIFFRACTION	Lecture	Daily and
		Fresnel fraunhofer		monthly
		diffraction, by a		exams,
		single slit, Further		assignments
				and reporting
Twelfth	3	Investigation of	Lecture	Daily and
		single – slit		monthly
				exams,
				assignments
				and reporting
Thirteenth	3	Third Exam	Lecture	Daily and
				monthly
				exams,
				assignments
TF 4 4	2	D 1:	T .	and reporting
Fourteenth	3	Aperture, Resolving	Lecture	Daily and
		power with a		monthly
		Rectangular		exams,
		Aperture, Chromatic		assignments
Fifteenth	3	Resolving power of	Lecture	and reporting Daily and
rinteentii		a prism,	Lecture	monthly
		α pπισιπ,		exams,
				assignments
				and reporting
Sixteenth	3	Circular Aperture,	Lecture	Daily and
		,,,		monthly
				exams,
				assignments
				and reporting
Seventeenth	3	Diffraction pattern,	Lecture	Daily and
		Rectangular		monthly
		_		exams,
				assignments
l				
		Resolving power of		and reporting

		a Telescope		monthly
		a relescope		
				exams,
				assignments
Nineteenth	3	Descling nerves of	Lecture	and reporting
Nineteenth	3	, Resoling power of	Lecture	Daily and
		a Microscope,		monthly
				exams,
				assignments
7D 41 41		TI D 11 1'	T (and reporting
Twentieth	3	The Double slit,	Lecture	Daily and
		qualitive Aspects of		monthly
		the pattern,		exams,
				assignments
T		7	—	and reporting
Twenty-one	3	Derivation of the	Lecture	Daily and
		Equation for the		monthly
		Intensity,		exams,
				assignments
			-	and reporting
Twenty-Two	3	Comparsion of the	Lecture	Daily and
		sigle- slit		monthly
				exams,
				assignments
				and reporting
Twenty-Three	3	and Double – slite	Lecture	Daily and
				monthly
				exams,
				assignments
				and reporting
Twenty-Four	3	patterns,	Lecture	Daily and
		Distinction,		monthly
				exams,
				assignments
				and reporting
Twenty-Five	3	between	Lecture	Daily and
		Interference and		monthly
		Diffraction		exams,
				assignments
		11		and reporting
Twenty-Six	3	problems.	Lecture	Daily and
				monthly
				exams,
				assignments
TE		DOL ADIZATION	<u> </u>	and reporting
Twenty-Seven	3	POLARIZATION	Lecture	Daily and
		Polarization by		monthly
		Reflection,		exams,
		Representation of.		assignments
		1 7711		and reporting
Twenty-eight	3	the Vibrations in	Lecture	Daily and
		light, polarization		monthly
		Angle and		exams,
		Brewsters law,		assignments

					and reporting
Twenty-nine	3	polarization by a	Le	ecture	Daily and
-		pile of plates, law of			monthly
		Malus, polarization			exams,
		by Dichroic crystals			assignments
					and reporting
Thirty 1	3	polarization by	Le	ecture	Daily and
		Double Refraction,			monthly
		polarization by			exams,
		scattering,			assignments
		problems			and reporting

11- Course Evaluation	
core for daily exams: 5, score for assignments Final exam score: 50	and reports: 10, score for monthly exams: 35
12- learning and Teaching Resources	
Required textbooks (methodology, if any)	Whit ,optics SEARS
Main references (sources)	physical optics
Recommended supporting books and references (scientific journals, reports)	Nothing
Electronic references, Internet sites	Optics and Photonics (2007) Graham Smith · Terry A.King

نموذج وصف المقرر

1- course name
Astronomy- second stage
2- course code:
Bachelor's
3-Semester / year
T.T £/T.T
4- Date this description was prepared

7.77/9/4

5- Available attendance forms

daily

6- Number of study hours (total) / number of units (total

60 hours

7-Name of the course

administrator (if more than one name is mentioned)

Name: Assist prov.Dr. Kawkab Dawood Salim, e.mail: kawkab_badri@tu.edu.iq

8- Course objectives

Objectives of the study subject . Learn about astrophysics. . Study of the celestial sphere . Study of galaxies, their speed and mass . Study of stars, their masses, speeds and distances between them . Study of planets, dwarf planets and asteroids . Study of comets, meteors and meteors. . Study of black holes and quasars.

9- Teaching and learning strategies

strategy

Lecture style, discussing with students, and asking and exchanging questions with students

. Study of dark matter

Course Structure - 1 .

week	hours	Name of the unit	Required learning outcomes	Learning method	Evalution method
first	2	Unit one	الفصل الأول Kepler's laws, celestial sphere, astronomical units	lecture	Daily and be monthly exams, assignments and reporting
second	2	Unit one	Celectial coordinate system	lecture	Daily and monthly exams, assignments and reporting
third	2	Unit two	Physicsl	lecture	Daily and

	T		, e		(1.1
			properties of		monthly exams,
			sun and moon		assignments
					Daily and
					monthly exams,
					assignments
					and reporting
					and reporting
fourth	2	Unit three	physical	Lecture	Daily and
			properties of		monthly exams,
			planets		assignments
					and reporting
fifth	2	Unit four	optical	Lecture	Daily and
			properties of		monthly exams,
			stars		assignments
					and reporting
sixth	2	Unit four	R-H diagram	Lecture	Daily and
			of stars and		monthly exams,
			problems		assignments
			1		and reporting
seventh	2	Unit four	Types of stars	Lecture	Daily and
Sevenien	_		and their life	Lecture	monthly exams,
			cycle		assignments
			cycle		and reporting
eight			1st exam		الثامن الثامن
ninth	2	Unit five	the stars	Lecture	Daily and
11111111	2	Unit five		Lecture	•
			systems		monthly exams,
					assignments
4 41-	2	II:4 C	C-11-4	T4	and reporting
tenth	2	Unit five	Calculating	Lecture	Daily and
			the mass of		monthly exams,
			stars in terms		assignments
			of the mass of		and reporting
1 (1		G. 41 .4	the sun		D 11 1
eleventh	2	Sixth unit		Lecture	Daily and
			Optical		monthly exams,
			properties of		assignments
	_		milkt way		and reporting
twelfth	2	Unit seventh	Types of	Lecture	Daily and
			galaxies		monthly exams,
					assignments
					and reporting
thirteenth	2	Unit seventh	effective	Lecture	Daily and
			galaxies types		monthly exams,
					assignments
					and reporting
fourteenth	2	Unit eighth		Lecture	Daily and
			Quasars, the		monthly exams,
		[age of the		assignments
			universe, and		and reporting
			U		and reporting
			universe, and the Hubble		and reporting
fifteenth	2	Unit eighth	universe, and	Lecture	and reporting Daily and

		origin of the universe and life in the universe	assignments nd reporting
sixteenth	2	 Second exam	

11- Course Evaluation

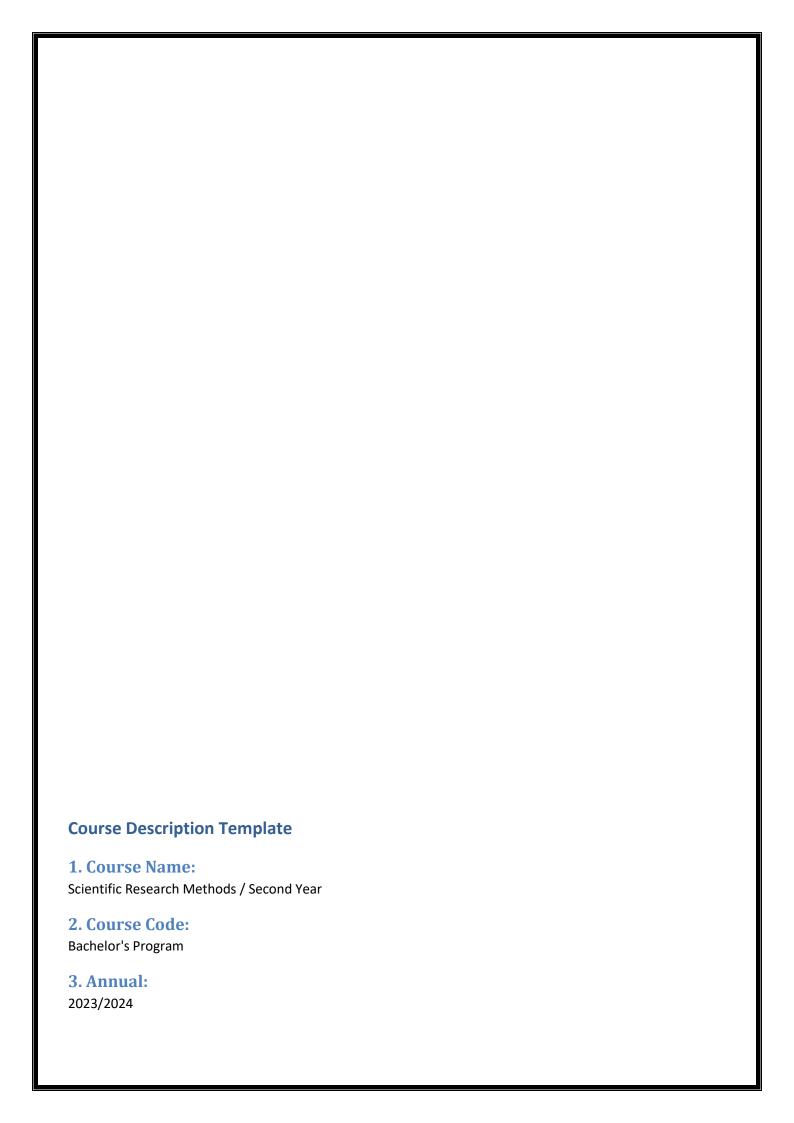
core for daily exams: 5, score for assignments and reports: 10, score for

monthly exams: 35

Final exam score: 50

12- learning and Teaching Resources

8	
Required textbooks (methodology,	
if any)	Course: The Book of Space, Part Two -
	Astronomy - Dr. Abdul Hamid Majoul Al-
	Naimi
Main references (sources) -	- Pathways to Anstronomy
	Stephen E. Schneider
	1
D 1.1 ('.1.1	
Recommended supporting books	
and references (scientific journals,	
(reports)	
	www.nasa.gov
Electronic references, Internet sites	
Licetionic references, internet sites	



4. Preparation Date of This Description:

27/4/2023

5. Available Attendance Options:

In-person

6. Total Study Hours / Units:

Total Hours: 2 Total Units: 4

7. Course Coordinator(s):

Name: Eng. Ahmed Talab Sabbar Email: ahmed.s.m.o.j@tu.edu.iq

8. Course Objectives:

- Deepen the undergraduate researcher's knowledge of scientific research steps.
- Introduce the researcher to the concept of research and the scientific method.
- Enable the researcher to define research hypotheses and problems.
- Familiarize the researcher with research classifications based on goals and methods.
- Introduce the researcher to research tools, their role in data collection, and their validity and reliability.

9. Teaching and Learning Strategies:

- Lecture method and student discussions.
- Engaging students with questions and exchanges.

Week	Hours	Learning Outcomes	Unit/Topic Name	Teaching Method	Assessment Method
1	2	Comprehension, Analysis, Synthesis	Origin and Evolution of Science and Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
2	2	Comprehension, Analysis, Synthesis	Scientific Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
3	2	Comprehension, Analysis, Synthesis	Types of Scientific Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
4	2	Comprehension, Analysis,	Research Problems,	Lecture,	Daily and Monthly

		Synthesis	Plans, and Hypotheses	Discussion	Exams, Assignments
5	2	Comprehension, Analysis, Synthesis	Scientific Research Methods and Tools	Lecture, Discussion	Daily and Monthly Exams, Assignments
6	2	Comprehension, Analysis, Synthesis	Historical Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
7	2	Comprehension, Analysis, Synthesis	Survey Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
8	2	Comprehension, Analysis, Synthesis	Descriptive Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
9	2	Comprehension, Analysis, Synthesis	Comparative Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
10	2	Comprehension, Analysis, Synthesis	Theoretical Mathematical Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
11	2	Comprehension, Analysis, Synthesis	Experimental Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
12	2	Comprehension, Analysis, Synthesis	Key Requirements for Experimental Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
13	2	Comprehension, Analysis, Synthesis	Sources of Information	Lecture, Discussion	Daily and Monthly Exams, Assignments
14	2	Comprehension, Analysis,	Databases	Lecture,	Daily and Monthly

		Synthesis		Discussion	Exams, Assignments
15	2	Comprehension, Analysis, Synthesis	Information Networks	Lecture, Discussion	Daily and Monthly Exams, Assignments
16	2	Comprehension, Analysis, Synthesis	Scientific Research Writing	Lecture, Discussion	Daily and Monthly Exams, Assignments
17	2	Comprehension, Analysis, Synthesis	Main Sections of Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
18	2	Comprehension, Analysis, Synthesis	Writing Style and General Format	Lecture, Discussion	Daily and Monthly Exams, Assignments
19	2	Comprehension, Analysis, Synthesis	Rules for Writing Footnotes	Lecture, Discussion	Daily and Monthly Exams, Assignments
20	2	Comprehension, Analysis, Synthesis	Main and Subheadings (Subdivisions)	Lecture, Discussion	Daily and Monthly Exams, Assignments
21	2	Comprehension, Analysis, Synthesis	Referencing by Numbers	Lecture, Discussion	Daily and Monthly Exams, Assignments
22	2	Comprehension, Analysis, Synthesis	Samples	Lecture, Discussion	Daily and Monthly Exams, Assignments
23	2	Comprehension, Analysis, Synthesis	Guidelines for Preparing Tables	Lecture, Discussion	Daily and Monthly Exams, Assignments
24	2	Comprehension, Analysis,	Summary or Abstract	Lecture, Discussion	Daily and Monthly Exams,

		Synthesis	Section		Assignments
25	2	Comprehension, Analysis, Synthesis	References or Sources Section	Lecture, Discussion	Daily and Monthly Exams, Assignments
26	2	Comprehension, Analysis, Synthesis	Methods of Citing References	Lecture, Discussion	Daily and Monthly Exams, Assignments
27	2	Comprehension, Analysis, Synthesis	Published Research in Scientific Journals	Lecture, Discussion	Daily and Monthly Exams, Assignments
28	2	Comprehension, Analysis, Synthesis	Card Indexing System	Lecture, Discussion	Daily and Monthly Exams, Assignments
29	2	Comprehension, Analysis, Synthesis	Illustrative Figures in Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
30	2	Comprehension, Analysis, Synthesis	Maps and Other Figures	Lecture, Discussion	Daily and Monthly Exams, Assignments

11. Assessment:

- Monthly Exams: 50% - Final Exam: 50%

12. Learning and Teaching Resources:

- Required Textbooks:
 - *Scientific Research Methods: For Primary Levels*
- Main References:
 - *Boyer, Carol, Science (Electronic Scientific Encyclopedia), 1998.*
- Additional Suggested Resources: None

1. (Course N	ame:					
Engli	English Language / Second Stage						
2. 0	Course Co	ode:					
Und	lergradua	ite					
3. s	Semester	/ Year:					
20	023- 2024	1					
4. I	Description	on Preparation Date:					
5/9	/ 2023						
5. A	vailable	Attendance Forms:					
D	aily						
		f Credit Hours (Total)	/ Numbe	er of Units (Total)			
60	hours						
7. C	ourse adı	ministrator's name (me	ntion all	l, if more than one	name)		
Teache Rola F Hammad Email: rula.f.ha .edu.iq	awwaz .mmad@						
8. C	Course C	Objectives					
Course	Objective	s		• learning	the basics of Eng	glish language	
				☐ studying s	ome tenses		
				□studying so	ome English style	es for speaking	
				• studying s	some physical ter	rms	
9. T	eaching	and Learning Strate	egies				
Strategy	L	ecture style, discussing	with st	udents, and asking	g questions to stu	dents	
10. Cc	urse St	ructure					
ww	Hours	Required Learning		Unit or subject	Learning	Evaluation	
		Outcomes		name	method	method	
First	2	Learn what is the b	pasics	Basics of	Lecture	Quiz	
1		of English Language		English			

How and when this tense | Present simple | Lecture

Monthly exam

2

Secon

d		is used	tense		
Third	2	Training for reading	Reading	Lecture	Daily listening
Fourt	2	How and when this tense	Future simple	Lecture	Monthly& daily
h		is used	tense		exam
Fifth	2	How this style is used	First conditional (If clause)	Lecture	Monthly& daily exam
Sixth	2	How to use this style	Future passive	Lecture	Monthly& daily exam
Seven th	2	How to use this style	Present passive	Lecture	Monthly& daily exam
Eight h	2	Students' Evaluation	First exam	Lecture	Monthly exam
Ninth	2	Knowing some physical terms	Terms	Lecture	Quiz
Tenth	2	Training for Speaking	Speaking	Lecture	Daily participants
Eleve	2	Training for reading	Reading	Lecture	Daily participants
Twelf	2	How to read decimal	Reading	Lecture	Monthly& daily
th		numbers	decimals		exam
Thirte	2	How to read years	Reading years	Lecture	Monthly& daily
enth					exam
Fourt	2	Knowing the time	Telling the	Lecture	Monthly& daily
eenth			time		exam
Fifteent h	2	What is the difference between such styles	So & such	Lecture	Monthly& daily exam

	2		Second exam	Lecture	Monthly exam
Sixteent					
h					
Seven	2	Training for writing	Story time	Lecture	Monthly& daily
teenth					exam
Eight	2	Knowing some	Definitions	Lecture	Monthly& daily
eenth		definitions			exam
Ninet	2	How to use this style	Comparative	Lecture	Monthly& daily
eenth					exam
Twent	2	How to use this style	Superlative	Lecture	Monthly& daily
ieth					exam
Twent	2	Knowing such a style in	Polite	Lecture	Monthly& daily
y first		2 nd language	Descripting		exam
Twent	2		Third Exam	Lecture	Monthly exam
y					
secon					
d					
Twent	2	Knowing the Meaning of	Physical terms	Lecture	Monthly& daily
y		some terms			exam
third					
Twent	2	Reinforcement students'	Vocabulary	Lecture	Monthly& daily
y		knowledge of vocabulary			exam
fourth					
Twent	2	Reinforcement students'	Synonyms	Lecture	Monthly& daily
y fifth		knowledge			exam

Twent	2	Reinforcement students'	Antonyms	Lecture	Monthly& daily
у		knowledge			exam
sixth					
Twent	2	Reinforcement students'	Matching	Lecture	Monthly& daily
У		knowledge			exam
sevent					
h					
Twent	2	Identify some linguistic	Obligation	Lecture	Monthly& daily
у		techniques for speaking			exam
eighth					
T	2		D :	т ,	
Twent	2		Review	Lecture	
у					
ninth					
Thirti	2	Students' Evaluation	Fourth Exam	Lecture	Monthly exam
eth					

1- Course name	
Atomic and molecular physics / third stage	
2- Course code / ATP023	
Bachelor's	
3- Semester / year	
7.75/7.78	
4- Date this description was prepared	

7.77/9/7

5- Available attendance forms

Day

6- Number of study hours (total) / number of units (total)

90 hour

7- Name of the course administrator (if more than one name is mentioned)

Name:- Assist. Prof. Dr:- Mohsin Hasan Ali , Email:- muhsin.astro@tu.edu.iq

8- Course objectives

Objectives of the study subject

Identify atomic physics.

- Study the theory of relativity.
- Study of atomic structure.
- Study atomic models
- Study the atomic spectra of the hydrogen atom.
- X-ray study.

Quantum theory of the hydrogen atom.

9- Teaching and learning strategies

Strategy

Lecture style, discussing with students, and asking and exchanging questions with students

10- Course Str	ucture				
Week	Hours	Name of the	Required	Learning	Evaluation
		unit or topic	learning	method	method
			outcomes		
First	3	Atomic physics	Basic concepts	Lecture	Daily and
					monthly exams,
					assignments
					and reporting
Second	3	Relativity	Basic concepts	Lecture	Daily and
		theory			monthly exams,
					assignments
					and reporting
Third	3	Relativity	Basic concepts	Lecture	Daily and
		hypotheses			monthly exams,
					assignments
					and reporting
Fourth	3	Finding the	Finding the	Lecture	Daily and
		results of the	results of the		monthly exams,
		theory of	theory of		assignments
		relativity	relativity		and reporting
Fifth	3	Lorentz	Lorentz	Lecture	Daily and
		transformations	transformations		monthly exams,
					assignments

					and reporting
Sixth	3	Study of atomic	Study of atomic	Lecture	Daily and
		structure	structure		monthly exams
					assignments
					and reporting
Seventh	3	Atomic models	Atomic models	Lecture	Daily and
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-				monthly exams
					assignments
					and reporting
Eighth	3	Assumptions of	Assumptions of	Lecture	Daily and
Lighth		Bohr's model of	Bohr's model of	Lecture	monthly exams
		the hydrogen	the hydrogen		assignments
		atom	atom		and reporting
		atom	atom		and reporting
Ninth	3	Assumptions of	Assumptions of	Lecture	Daily and
		the	the		monthly exams
		Summerfield	Summerfield		assignments
		model of the	model of the		and reporting
		hydrogen atom	hydrogen atom		and reporting
		nyur ogen atom	nyurogen atom		
Tenth	3	Know the wave	the wave	Lecture	Daily and
		properties of	properties of		monthly exams
		particles	particles		assignments
		F ** * * * * * * * * * * * * * * * * *	1		and reporting
Eleventh	3	Learn about	Learn about	Lecture	Daily and
		Herzberg's	Herzberg's	Lecture	monthly exams
		principle of	principle of		assignments
		inaccuracy	inaccuracy		and reporting
		maccuracy	maccuracy		and reporting
Twelfth	3	Knowledge of	electron	Lecture	Daily and
		electron	diffraction		monthly exams
		diffraction			assignments
					and reporting
Thirteenth	3	Knowledge of	DeBroglie's	Lecture	Daily and
		DeBroglie's	principle		monthly exams
		principle	r · r		assignments
		r · r			and reporting
Fourteenth	3	Learn about	Learn about	Lecture	Daily and
	•	Davison's	Davison's		monthly exams
		electron	electron		assignments
		diffraction	diffraction		and reporting
		experiment	experiment		and reporting
Fifteenth	3	Recognize the	Recognize the	Lecture	Daily and
		difference	difference		monthly exams
		between wave	between wave		assignments
		and particle	and particle		and reporting
		behavior of	behavior of		
		matter	matter		
Sixteenth	3	X-ray	X-ray	Lecture	Daily and
		identification	identification		monthly exams
					assignments

					and reporting
Seventeenth	3	Knowledge of	X-ray spectra	Lecture	Daily and
Seventeenth		X-ray spectra	11 Tuy spectru	Lecture	monthly exams,
		та тыў кросоты			assignments
					and reporting
Eighteenth	3	Knowledge of	X-ray	Lecture	Daily and
Eighteenth	3	_	diffraction	Lecture	•
		X-ray diffraction	diffraction		monthly exams,
		diffraction			assignments
					and reporting
Nineteenth	3	Knowledge of	fluorescent X-	Lecture	Daily and
		fluorescent X-	rays		monthly exams,
		rays			assignments
					and reporting
Twentieth	3	Identify the	Identify the	Lecture	Daily and
		ways radiation	ways radiation		monthly exams,
		interacts with	interacts with		assignments
		matter	matter		and reporting
		mutter	mutter		and reporting
Twenty-one	3	Learn about the	Learn about the	Lecture	Daily and
1 Wenty-one	J	photoelectric	photoelectric	Lecture	monthly exams,
		effect	effect		assignments
		ciicci	CHCC		_
Towns to Town	3	Know the	the Commton	Tastuns	and reporting
Twenty-Two	3		the Compton	Lecture	Daily and
		Compton effect	effect		monthly exams,
					assignments
					and reporting
Twenty-Three	3	Knowledge of	the	Lecture	Daily and
		the	phenomenon of		monthly exams,
		phenomenon of	production and		assignments
		production and	annihilation of		and reporting
		annihilation of	the pair		
		the pair			
Twenty-Four	3	Knowledge of	non-radioactive	Lecture	Daily and
•		non-radioactive	transitions and		monthly exams,
		transitions and	the Oker		assignments
		the Oker	phenomenon		and reporting
		phenomenon	phenomenon		and reporting
		phenomenon			
Twenty-Five	3	Knowledge of	X-ray	Lecture	Daily and
I wenty-I ive	J	X-ray	absorption	Lecture	monthly exams,
		absorption	ลมรบา puon		assignments
		ลมรบา หนบท			_
T	2	V-s-l-l-C	4h o our 4-	T c-4-	and reporting
Twenty-Six	3	Knowledge of	the quantum	Lecture	Daily and
		the quantum	theory of the		monthly exams,
		theory of the	hydrogen atom		assignments
		hydrogen atom			and reporting
Twenty-Seven	3	Knowledge of	basic quantum	Lecture	Daily and
		basic quantum	numbers		monthly exams,
		numbers			assignments
1			1	1	1 4
					and reporting

		electron configuration and Pauli exclusion principle	configuration and Pauli exclusion principle		monthly exams, assignments and reporting
Twenty-nine	3	Learn about molecular physics and molecular bonds	molecular physics and molecular bonds	Lecture	Daily and monthly exams, assignments and reporting
Thirty 1	3	Knowledge of molecular spectra	molecular spectra	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation	
core for daily exams: 5, score for assignments at Final exam score: 50	nd reports: 10, score for monthly exams: 35
12- learning and Teaching Resources	
Required textbooks (methodology, if any)	Concepts in modern physics
Main references (sources)	Concepts in modern physics / written by Erth Pizer
Recommended supporting books and	Nothing
references (scientific journals, reports)	
Electronic references, Internet sites	General physics websites

1- Course name
Electronic / third stage
2- Course code /
Bachelor's
3- Semester / year
T.T £/T.T

4 D	.1 .	1 .	, •		1
4- Date	this	descri	ption	was	prepared

7.77/9/7

5- Available attendance forms

Day

6- Number of study hours (total) / number of units (total)

90 hour

7- Name of the course administrator (if more than one name is mentioned)

Name:- Assist. Prof. Dr:- Ibrahim Khalaf Salman , Email:-

ibrahim.k.salman@tu.edu.iq

8- Course objectives

o course objectives	
Objectives of the study subject	 Learn about semiconductors.
	 Study the movement of electrons and
	electron physics.
	• Study the physics of semiconductors.
	• Study the feedback in electronic circuits.
	• Study logic circuits.
	• Study integrated circuits.
	Nanotechnology
O. T. 1. 11	

9- Teaching and learning strategies

Strategy	Lecture style, discussing with students, and
	asking and exchanging questions with
	students

Week	Hours	Name of the unit or	Required	Learning	Evaluation
		topic	learning	method	method
			outcomes		
First	3	Introduction to	Basic concepts	Lecture	Daily and
		Semiconductors	_		monthly
					exams,
					assignments
					and reporting
Second	3	Learn about the energy	The energy	Lecture	Daily and
		band theory and its	band theory in		monthly
		effect on materials	solids		exams,
					assignments
					and reporting
Third	3	Semiconductor Diode	Basic	Lecture	Daily and
			Concepts		monthly
					exams,
					assignments
					and reporting
Fourth	3	Diode characteristics	Learn how to	Lecture	Daily and
		curve, temperature	form a pn		monthly

Sixth 3 Learn about the components of the equivalent circuit, how it works, its applications, and its.effect on temperature Eighth 3 Learn about the transistor Operation Limitations Emitter Bias Circuits Transistor operation Lecture Bias Circuits Transistor operation Transi	and hly ns, nents orting and hly ns, ments orting and hly ns, ments orting and hly hly hly ns, hence the orting and hly hly
Fifth 3 Learn about the applications of semiconductor diodes Sixth 3 Learn about Zener Diode and Applications of texas assignment of texas assign	and hly ns, nents orting and hly ns, nents orting and hly ns, and and hly hly hly ns, and hly
Fifth 3 Learn about the applications of semiconductor diodes Sixth 3 Learn about Zener Diode and Applications Sixth 3 Learn about the components of the equivalent circuit, how it works, its applications, and its effect on temperature Eighth 3 Learn about the transistor and how to connect it Ninth 3 Transistor Bias and Transistor Operation Limitations Emitter Bias Circuits Tenth 3 Knowing the parameters of transistor operation Tenth 4 Tansistor operation transistor operation transistor operation of transistor operation transistor operation transistor operation operation operation Sixth 3 Learn about Zener Diode and Applications assignmand reputation semiconductor diodes Applications of semiconductor diodes Applications of semiconductor diodes Applications Lecture Daily mont exam assignmand reputation semiconductor diodes The equivalent circuit, how it works, its applications, and its effect of temperature Transistor Diode and Applications and the effect of temperature Transistor Diode and Applications and the equivalent circuit of a Zener diode and the effect of temperature Transistor Diode and Applications assignmand reputation and reputation and reputation and reputation and Effect of Temperature on Transistor Operation Transistor Operation Diode and Applications assignmand reputation and reputation and reputation and reputation and reputation and reputation and reputations assignment and reputation and reputation and reputations assignment and reputation and reputation and reputations and the effect of Temperature on Transistor Operation and reputation and reputation and reputation and reputations are provided and the effect of temperature on Transistor Operation and reputations and reputations are provided and the effect of temperature on Transistor Operation and reputations are provided and the effect of temperature on Transistor Operation and reputations are provided and the effect of temperature on Transistor Operation and reputations are provided and the effect of temperature of temperatur	and hly ns, nents orting and hly ns, nents orting and hly ns, nents orting and hly
Fifth 3 Learn about the applications of semiconductor diodes Sixth 3 Learn about Zener Diode and Applications Seventh 3 Learn about the components of the equivalent circuit, how it works, its applications, and its .effect on temperature Eighth 3 Learn about the transistor and how to connect it Ninth 3 Transistor Bias and Transistor Operation Limitations Emitter Bias Circuits Tenth 3 Knowing the parameters of transistor operation Tenth 4 Semiconductor diodes Semiconductor diodes Zener Diode Lecture Daily mont exam assignm and reportation exam assignm and reportation and Lecture Daily mont connect it The equivalent circuit of a Zener diode and the effect of temperature assignm and reportation and Effect of Temperature on Transistor Transistor Departion Tenth 3 Knowing the parameters of transistor operation exam operation exam the connect of transistor operation operation exam the connect of the semiconductor diodes Electure Daily mont the exam assignm and report the connect of transistor operation operation the exam the connect of the semiconductor diodes Tenth 2 Lecture Daily mont the exam the circuit of a Zener diode and the effect of temperature of transistor operation the exam the circuit of a Zener diode and the effect of temperature of temperature on Transistor operation operation operation operation on the exam the circuit of a Zener diode and the effect of temperature or temperature on Transistor operation oper	hly ns, nents orting and hly ns, nents orting and hly
Sixth 3 Learn about Zener Diode and Applications Diode and tree circuit of a Zener diode and the effect of temperature Diode and Applications Diode and Effect of Temperature Diode and the effect of temperature	hly ns, nents orting and hly ns, nents orting and hly
Sixth 3 Learn about Zener Diode and Applications Zener Diode and Applications Lecture Dioly and Applications	ns, nents orting and hly ns, nents orting and hly
Sixth 3	nents orting and hly ns, nents orting and hly
Sixth 3	orting and hly ns, nents orting and hly
Sixth 3	and hly ns, nents orting and hly
Seventh 3	hly ns, nents orting and hly
Seventh 3 Learn about the components of the equivalent circuit, how it works, its applications, and its effect on temperature Eighth 3 Learn about the transistor and how to connect it Ninth 3 Transistor Bias and Transistor Operation Limitations Emitter Bias Circuits Tenth 3 Knowing the parameters of transistor operation Tenth 3 Knowing the parameters of transistor operation Tenth 1 Applications exam assignm and report in temperature and the equivalent circuit of a Zener diode and the effect of temperature Bipolar Transistor Transistor Bias and Transistor Bias and Load Line and Effect of Temperature Tenth 3 Knowing the parameters of transistor operation Lecture Daily mont exam assignm and report operation Transistor operation	ns, nents orting and hly
Seventh Sequivalent circuit, how it works, its applications, and its effect on temperature Seffect on temperature Selighth Separate sof transistor operation Tenth Seventh Sequivalent circuit, how it works, its applications, and its effect of temperature Seventh Sequivalent circuit, how it works, its applications, and its effect of temperature Separate sof transistor bias and Transistor Bias and Load Line and Effect of Temperature on Transistor Operation Tenth Seventh Seventh Sequivalent circuit, how it works, its and the effect of temperature Transistor Bipolar Transistor Seventh Sequivalent circuit, how it works, its and the effect of temperature Transistor Separate sof temperature Seventh Sequivalent circuit of a Zener diode and the effect of temperature Transistor Separate sof temperature Sequivalent circuit of a Zener diode and the effect of temperature Transistor Bipolar Transistor Bias and Transistor Bias and Load Line and Effect of Temperature on Transistor Operation Tenth Sequivalent circuit, how it works, its and the effect of temperature Transistor Bipolar Transistor Bias and Transistor Bias and Load Line and Effect of Temperature on Transistor Operation Tenth Seventh Circuits Bipolar Transistor Sequivalent Circuit of a Zener diode and the effect of temperature Transistor Seventh Circuit of a Zener diode and the effect of temperature Transistor Seventh Circuit of a Zener diode and the effect of temperature Seventh Circuit of a Zener diode and the effect of temperature Seventh Circuit of a Zener diode and the effect of temperature Seventh Circuit of a Zener diode and the effect of temperature Seventh Circuit of a Zener diode and the effect of temperature Seventh Circuit of a Zener diode and the effect of temperature Seventh Circuit of a Zener diode and the effect of temperature Seventh Circuit of a Zener diode and the effect of temperature S	nents orting and hly
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Seventh 3	and hly
Components of the equivalent circuit, how it works, its applications, and its effect on temperature Circuit of a Zener diode and the effect of temperature Connect it	hly
Components of the equivalent circuit, how it works, its applications, and its effect on temperature Connect it	hly
Eighth 3 Learn about the transistor and how to connect it Eighth 3 Transistor Bias and Transistor Operation Limitations Emitter Bias Circuits Bias Circuits Transistor Eighth 3 Knowing the parameters of transistor operation Transistor Eighth 3 Transistor Bias and Transistor Department Transistor Bias Lecture Daily	•
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Eighth 3 Learn about the transistor and how to connect it	
Seffect on temperature Sipolar Lecture Daily	
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Limitations Emitter Bias Circuits Temperature on Transistor Operation Tenth T	
Bias Circuits Temperature on Transistor Operation Tenth 3 Knowing the parameters of transistor operation Tensistor operation Tensistor operation Tensistor operation Temperature assignment and report on Transistor operation and report on Tensistor operation Electure Daily mont operation	•
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Tenth 3 Knowing the parameters of transistor operation Operation Daily mont operation exam	
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parameters of transistor operationTransistor operationmont exam	1
transistor operation operation exam	
	•
and the stability of the parameters assignment	
transistor operation and repo	
Eleventh 3 Learn about common Common Lecture Daily	
emitter bias emitter bias mont	-
mechanism, connection circuits exam	
methods and gain assignment assig	
coefficients and repo	
Twelfth 3 Understanding Bipolar Lecture Daily	and
Bipolar Transistor mont	hly
Amplifiers Amplifiers exam	
assignm	ns,
and repo	
Thirteenth 3 Transistor Transistor and Lecture Daily	nents
Amplifier Amplifier mont	nents orting
Working Equivalent exam	nents orting and
Principle and Circuit assignment	nents orting and hly
Equivalent and repo	nents orting and hly ns,
Circuits	nents orting and hly ns, nents
	nents orting and hly ns, nents

Fourteenth	3	Learn how	Multistage	Lecture	Daily and
		multistage	amplifiers		monthly
		amplifiers work			exams,
					assignments
					and reporting
Fifteenth	3	Getting to know	Thyroidesters	Lecture	Daily and
		thyroesters			monthly
					exams,
					assignments
					and reporting
Sixteenth	3	Types of thyristors and	Thyroidesters	Lecture	Daily and
		their applications			monthly
					exams,
					assignments
~		+	71 11 7 00		and reporting
Seventeenth	3	Learn about	Field Effect	Lecture	Daily and
		field effect	Transistors		monthly
		transistors and			exams,
		their types			assignments
					and reporting
Eighteenth	3	Knowing how to	Bias circuits for	Lecture	Daily and
Eighteenth	3	bias field effect	field effect	Lecture	monthly
		transistors and	transistors and		exams,
		their	their uses		assignments
		applications	then uses		and reporting
		WFF			
N T* 4 41	2	Y 1 4	n	T 4	D '1 1
Nineteenth	3	Learn about	Power	Lecture	Daily and
		power	amplifiers		monthly
		amplifiers, their types and uses			exams,
		types and uses			assignments and reporting
					and reporting
Twentieth	3	Operational	Power	Lecture	Daily and
_ ,,		Amplifiers	Amplifiers		monthly
		P	F		exams,
					assignments
					and reporting
Twenty-one	3	Learn about	Negative	Lecture	Daily and
·		feedback and its	feedback		monthly
		types			exams,
					assignments
					and reporting
Twenty-	3	Learn about the	Negative	Lecture	Daily and
Two		types of	feedback		monthly
		feedback loops			exams,
		and their effects			assignments
					and reporting
T	2	Docitivo	D	I c c4	Deiler 1
Twenty- Three	3	Positive feedback	Positive feedback and	Lecture	Daily and monthly
1 111 66		iccuback	iccuback and		monuny

			oscillators		OV 0 400 C
			oscillators		exams,
					assignments
					and reporting
Twenty-	3	Understanding	Positive	Lecture	Daily and
Four		Oscillators Oscillation	Feedback and		monthly
		Terms and Types of	Oscillators		exams,
		Oscillators			assignments
					and reporting
Twenty-Five	3	Understanding	Logic Circuits	Lecture	Daily and
		Logic Circuits			monthly
					exams,
					assignments
					and reporting
Twenty-Six	3	Types of logic	Logic gates	Lecture	Daily and
1 Welley SIR		gates and their	Logic gutes	Lecture	monthly
		applications			exams,
		аррисация			assignments
					and reporting
Twenty-	3	Learn about	Integrated	Lecture	Daily and
Seven	3		circuits	Lecture	-
Seven		integrated	circuits		monthly
		circuits, their			exams,
		advantages and			assignments
		their			and reporting
		manufacture			
Twenty-	3	Optical etching	Integrated	Lecture	Daily and
eight	J	and IC	circuits and	Lecture	monthly
cigit		component	layer formation		exams,
		manufacturing	layer formation		assignments
		manufacturing			and reporting
					and reporting
Twenty-nine	3	Basic Concepts	Nanotechnology	Lecture	Daily and
1 wenty-mine	3	of	Tanoceminology	Lecture	monthly
		Nanomaterials			•
		1 vanomateriais			exams,
					assignments
Thirder (2	Looun obout	Carkan	Lagteres	and reporting
Thirty ⁾	3	Learn about	Carbon	Lecture	Daily and
		Nano Carbon	Nanotubes and		monthly
		and	Nano		exams,
		Nanotechnology	transistors		assignments
		Applications			and reporting
Ì					

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35 Final exam score: 50

12- learning and Teaching Resources	
Required textbooks (methodology, if any)	Electronics Basics
Main references (sources)	- Basics of Electronics / Written by
	Prof. Dr. Samir Atta Makki and M.D.
	Imad Hadi Khalil
Recommended supporting books and	Electron Physics / Written by Dr. Sobhi
references (scientific journals, reports)	Saeed Al-Rawi
Electronic references, Internet sites	General physics websites

	1- Course name
	Analytical Mechanics / n ^{3d} stage
	2- Course code / -MAP043
ľ	
	3- Semester / year

2023/2024	
4- Date this description was pre	pared
3/9/2023	
5- Available attendance forms	
Day	
6- Number of study hours (total) / number of units (total)
90 hour	
7- Name of the course administrationed)	rator (if more than one name is
Name: Prof. dr. :Niran F. Abd	uljabar , Email:-
niran.fadhil64@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	 Introducing students to the basics of analytical mechanics. basic concepts in mechanics, equations of motion. differential and integral calculus of particles. Kepler's laws collisions and their types. Lagrange's equations Hamilton's equations. conservative forces. first and second order
9- Teaching and learning strate	
Strategy	Lecture style, discussing with students, and asking and exchanging questions with students

10-Cour	se Structure	9			
The week	Hours	Name of the unit or topic	Required learning outcomes	Teachin g method	Evaluat ion method
2	6	Definition of basic vector concepts	Definition of basic concepts (vectors)	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
4	6	Vector calculator and kinematics	Vector calculus and kinematics	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
6	6	Velocity and acceleration in polar and plane coordinates	Velocity and acceleration in plane polar coordinates	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
8	6	Velocity and acceleration in cylindrical and spherical	Velocity and acceleration in cylindrical and spherical coordinates	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
9		First exam	First exam		
10	3	Particle dynamic	particle dynamics	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
11	3	Movement in a straight line	Motion in a straight line	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
12	3	Newton's laws of motion	Newton's laws of motion	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
13		Vector component and unit vector	Vector components and vector unit	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
13	3	Addition and subtraction of vectors	Properties of vector addition and subtraction	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
14	3	Mass, force and linear	Mass, Force, and Linear	According to the point8Abo	According to the point8Abo

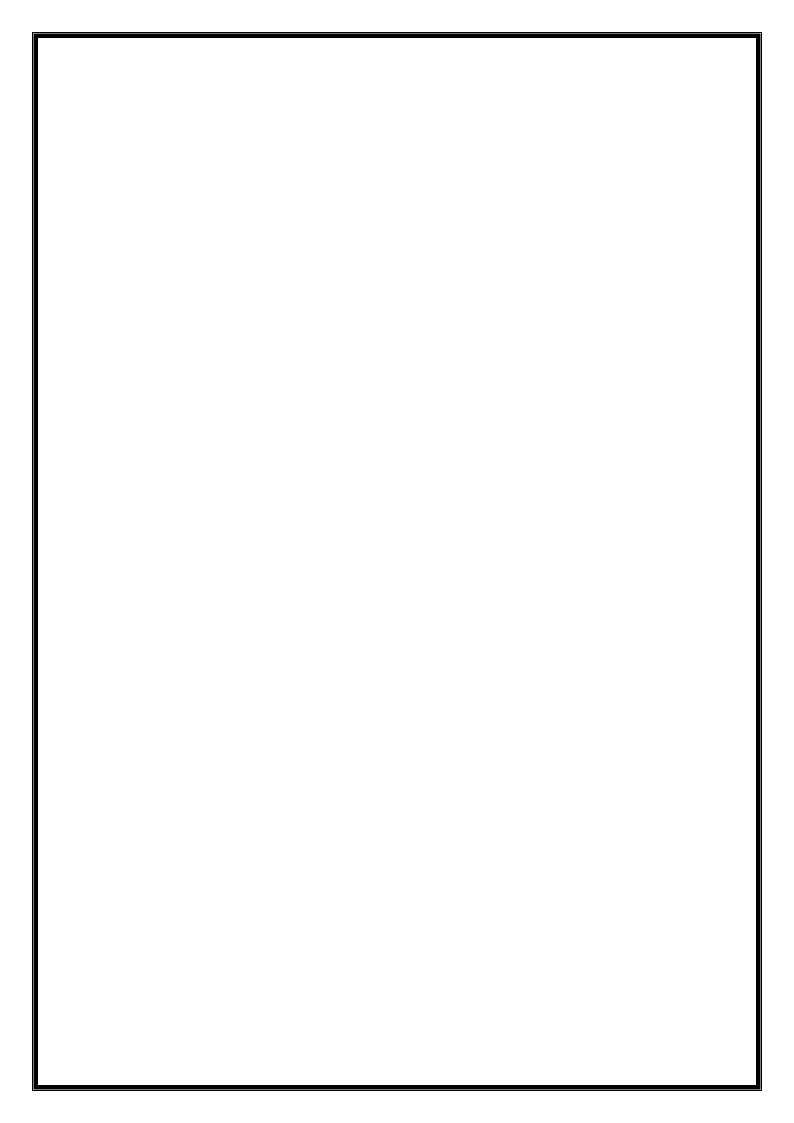
		momentum	Momentum	ve or as needed	ve or as needed
15	3	Scalar and	Scalar and	According	According
		vector product	vector product	to the	to the
		of two vectors	of two vectors	point8Abo ve or as	point8Abo ve or as
			01000010	needed	needed
16	3		Second exam		
17		Partial	Partial	According	According
		differentiation	derivatives for	to the	to the
			calculating	point8Abo ve or as	point8Abo ve or as
			velocity and	needed	needed
			acceleration		
17	3		Force as a	According	According
			function of	to the point8Abo	to the point8Abo
			position	ve or as	ve or as
			And speed	needed	needed
18	3	The labor base and	Employment	According	According
		conservative forces	base and	to the point8Abo	to the point8Abo
			conservative	ve or as	ve or as
			forces	needed	needed
19	3	Potential	Potential	According to the	According to the
			energy function	point8Abo	point8Abo
			and conditions	ve or as	ve or as
			for the	needed	needed
			existence of the		
			potential		
0.0		D 1: 00	function	A 1'	A 1'
20	3	Delta effect	Delta effect	According to the	According to the
				point8Abo	point8Abo
				ve or as	ve or as
21	3		Solve the	needed According	needed According
21	3			to the	to the
			separation	point8Abo	point8Abo
			equation	ve or as needed	ve or as needed
22	3	Center force	Central forces,	According	According
<i></i>	3	law of gravity	law of gravity,	to the	to the
		iaw of gravity	potential	point8Abo	point8Abo
			energy in a	ve or as needed	ve or as needed
			central field	1100000	nooded
23	3	Center of mass,	Center of mass	According	According
		linear	and linear	to the	to the
		momentum,	momentum	point8Abo ve or as	point8Abo ve or as
		kinetic energy	Kinetic energy	needed	needed
		of a system 0f	of a system of		

		particles	particles		
24	3		Third exam		
25	3	Direct and oblique collision	Direct and oblique collisions	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
26	3	Lacrange and Hamilton equation	Lacrange and Hamilton equations	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
27	3	Oscillation theory,potential energy	Fluctuation theory, potential energy and equilibrium, stability	According to the point8Abo ve or as needed	According to the point8Abo ve or as needed
	3		Fourth exam		Evaluati on method

11-Course Evaluation

- 1-Updating the curriculum requirements according to what is approved in international universities.
- 2- Building a computer lab for the purpose of preparing mathematical models to solve complex physical problems.

12-learning and Teaching Resources	
Calculus and Analytic geometry by Goerge	1- Required textbooks
Thomas 7th edition	
Book by Grant R. Fowles	2- Main references (sources)
Institute of Physics, University of Badji	
Mokhtar	
	A- Recommended books and
	references (Scientific
	journals, reports,)
	B - Electronic references,
	websites



1- Course name Thermodynamics/thied stage 2-Course code **THP033 Bachelors** 3- Semester /year 7.70_7.75 4-The date this description was prepared 2024/1/15 5- Available attendance forms **Daily** 6- Total number of study hours/ Total number of units 90 hours 7- Name of the course administrator Name: Dr safa khalil ibrahem e-mail safakhalil1989@tu.edu.iq 8- Course objecttives Objectives of the study subject A1- Identifying thermal energy A2- Identifying the laws of heat transfer between substances A3- Identifying the laws of transfer of materials between their four states A4- Knowing and nderstanding the control of pressure and temperature in the states of matter A5- Knowing and understanding the general law of gases A6- Knowing the type of gases and the differences between them And between the ideal gas A7- Identifying the difference in the results of mathematical analysis A8- Understanding the first, second and third laws of thermodynamics

9- Teaching and learning strategies The method of lecturing, discussing with students, and asking and exchanging questions with students

1	l	Cou	rse	stri	ıctıı	re
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10- Course st				
Evaluation	Teaching	Name of the unit/or topic	hours	week
method	method			
According to point 8 above and as needed	According to point 8 above and as needed	Basic concepts in thermodynamics, states of matter, solid state, liquid state, gaseous state, plasma, gas and steam, saturated vapor	6	2
According to point 8 above and as needed	According to point 8 above and as needed	Basic curves of evaporation and boiling, Clapyron's equation, solving examples and questions, mathematical theory in thermodynamics, general gas law	6	4
According to point 8 above and as needed	According to point 8 above and as needed	state function, compressibility, extensibility, compressibility in an ideal gas, path function, open path, closed path.	6	6
		First Exam		8
According to point 8 above and as needed	According to point 8 above and as needed	Work, work done in different processes, work done in an ideal gas, work in Vandel-Wales rates, work done by changing volume, work done by changing pressure, Focal points and principal points, Generel thick – Lens Formula	6	6
According to point 8 above and as needed	According to point 8 above and as needed	Equations of general state of gases, equations of state for ideal gases by theoretical and practical method, Boyle's law, Charles' law, Dalton's law, Joule's law	٣	11
According to point 8 above and as needed	According to point 8 above and as needed	The general constant of gases, the Vandelois equation, pressure correction, volume correction, finding the values of the critical constants of the Vandelois equation, corresponding cases	٦	١٣

		Second Exam		10
According to point 8 above and as needed	According to point 8 above and as needed	state modifiers for other entities, state modifiers for an open wire, state modifiers for a paramagnetic material, state modifiers for an electric cell	٦	١٦
According to point 8 above and as needed	According to point 8 above and as needed	The first law of thermodynamics, applications of the first law of thermodynamics, results of the first law, Joule's experiment, enthalpy	٦	۲.
According to point 8 above and as needed	According to point 8 above and as needed	Expansion, free expansion, expansion by suffocation. Joule-Kelvin experiment, derivation of the degree of transformation of gases, the relationship between internal energy and enthalpy.	٦	Y £
According to point 8 above and as needed	According to point 8 above and as needed	Heat capacity, Rieghard's method for measuring gamma, Carnot cycle, second law of thermodynamics, applications in thermodynamics	٦	۲۸
		Third Exam		49
Evaluation method	Teaching method	Name of the unit/or topic	hours	week
According to point 8 above and as needed	According to point 8 above and as needed	Basic concepts in thermodynamics, states of matter, solid state, liquid state, gaseous state, plasma, gas and steam, saturated vapor	٦	2
According to point 8 above and as needed	According to point 8 above and as needed	Basic curves of evaporation and boiling, Clapyron's equation, solving examples and questions, mathematical theory in thermodynamics, general gas law	7	4
According to point 8 above and as needed	According to point 8 above and as needed	state function, compressibility, extensibility, compressibility in an ideal gas, path function, open path, closed path.	٦	6
		First Exam		8
According to point 8 above and as needed	According to point 8 above and as needed	Work, work done in different processes, work done in an ideal gas, work in Vandel-Wales rates, work done by changing volume, work done by changing pressure, Focal points and principal points, Generel thick – Lens Formula	7	مر

According to point 8 above and as needed	According to point 8 above and as needed	Equations of general state of gases, equations of state for ideal gases by theoretical and practical method, Boyle's law, Charles' law, Dalton's law, Joule's law	٣	11
According to point 8 above and as needed	According to point 8 above and as needed	The general constant of gases, the Vandelois equation, pressure correction, volume correction, finding the values of the critical constants of the Vandelois equation, corresponding cases	٦	١٣
According to point 8 above and as needed	According to point 8 above and as needed	Second Exam		10
According to point 8 above and as needed	According to point 8 above and as needed	state modifiers for other entities, state modifiers for an open wire, state modifiers for a paramagnetic material, state modifiers for an electric cell	٦	١٦
According to point 8 above and as needed	According to point 8 above and as needed	The first law of thermodynamics, applications of the first law of thermodynamics, results of the first law, Joule's experiment, enthalpy	٦	۲.
According to point 8 above and as needed	According to point 8 above and as needed	Expansion, free expansion, expansion by suffocation. Joule-Kelvin experiment, derivation of the degree of transformation of gases, the relationship between internal energy and enthalpy.	٦	۲ ٤
According to point 8 above and as needed	According to point 8 above and as needed	Heat capacity, Rieghard's method for measuring gamma, Carnot cycle, second law of thermodynamics, applications in thermodynamics	٦	۲۸
		Third Exam		۲۹

11-Course evaluation

Daily exam score: 5, daily exam score: 10, monthly exam score: 35,

final exam score: 50

12- Learing and teaching resources

8 8	
FUNDAMENTALS OF thermodynamics	Required prescribed books (methodology, if any).
Thermodynamics -	Main references (sources)
Thermodynamics and Schaum series	Recommended supporting books and references
	(scientific journals, reports)
General physics websites	Electronic references, Internet sites

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Course	Descri	ntinn	Horm
Course	Descri		1 01 111

1. Course name

Semiconductors/Third Stage

2. Course code.

Bachelor

3. Chapter/Year

7.75/7.78

4. Date this description was prepared

7.77/9/7

5. Available attendance forms

weekly

6. Number of study hours (total) / Number of units (total)

۱ · hours

7. Name of course administrator (if more than one name is given)

Lecturer Dr. Rasha Abbas Abdullah

rasha.a.awni@tu.edu.iq

Lecturer Dr. Shahad Ahmed Diab

shahed.ahmed@tu.edu.iq

8. Course objectives

Subject objectives	

Learn about crystal structures and bonding.

Learn about crystallography.

Learn about crystal defects and types of solids in terms of crystallization.

Learn about the Hall effect.

Learn about the optical and electrical properties of semiconductors.

Understand the doping mechanism in semiconductors.

Learn about the photoelectric properties of semiconductors.

Understand the p-n junction

Learn about the energy diagram in semiconductors.

and exchanging questions with students

9. Teaching and learning strategies

Strategy

Lecture style, discussing with students, and asking

10. Course structure							
The week	Watches	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method		
the first	*	Knowing the types of bonds, the characteristics of each type, and how it is affected	Insistence	The lecture	Daily and monthly exams, assignments and reporting		
the second	*	Learn about the crystal structure of materials and how to classify materials according to crystallization.	Crystal structures.	The lecture	Daily and monthly exams, assignments and reporting		
the third	*	Identify the types of crystal lattices and crystal systems.	Crystal systems and the Paravisian lattice.	The lecture	Daily and monthly exams, assignments and reporting		
Fourth	*	Identify crystal trends, Miller coefficients, and .inverted lattices	Crystalline trends and crystal planes.	The lecture	Daily and monthly exams, assignments and reporting		
Fifth	۲	Classification of crystalline defects and their details.	Crystalline defects.	The lecture	Daily and monthly exams, assignments and reporting		
Sixth	*	Introduction to solid state theory and electron behavior in crystals.	Solid state theory.	The lecture	Daily and monthly exams, assignments and reporting		
Seventh	۲	Learn the concept of energy packages and study the types .of packages	Energy packs.	The lecture	Daily and monthly exams, assignments and reporting		
eighth	4	Understand the relationship between energy and momentum.	Energy and momentum.	The lecture	Daily and monthly exams, assignments and		

_		_	<u>, </u>		
					reporting
ninth	*	Application of Fermi-Dirac statistics, knowledge of ionization of impurity atoms, phonons, Hall effect.	Density of states in energy bands.	The lecture	Daily and monthly exams, assignments and reporting
tenth	Y	Learn about the optical properties of semiconductors.	Properties of semiconductors.	The lecture	Daily and monthly exams, assignments and reporting
eleven	۲	Study of different types of electronic transitions.	Electronic transfers.	The lecture	Daily and monthly exams, assignments and reporting
Twelve	*	Understand charge generation and combination processes, majority and minority charge carriers, and spontaneous emission.	Reproductive processes_reunion.	The lecture	Daily and monthly exams, assignments and reporting
thirteen	*	Understand the mobility of charge carriers, conductivity, resistivity, diffusion and drift of charge carriers.	Mobility of charge carriers.	The lecture	Daily and monthly exams, assignments and reporting
Fourteen	*	Understand the p-n junction, depletion region, voltage barrier and study the junction in steady state and biased state.	p-n junction	The lecture	Daily and monthly exams, assignments and reporting

11. Course Evaluation

Daily exams score: 10, Homework and reports score: 10, Monthly exam score:

30

Final exam score: 50

12. Learning and teaching resources

Required textbooks (methodology	Semiconductor devices.
if any)	

Main References (Sources)	Solid State Physics Part One Dr. Muayad		
	Gabriel. Introduction to Semiconductor		
	Physics Dr. Yousry Mustafa and Dr. Al-		
	Husseini Taher.		
Recommended supporting books	nothing		
and references (scientific journals,			
reports)			
Electronic references, websites	General Physics Sites		

Course Description

Course Description Template

1. Course Name: Teaching Methods / Third Year

2. Course Code: Bachelor's

3. Year: 2023/2024

4. Date of Preparation: 27/04/Y·YT

5. Available Attendance Formats: In-person

6. Total Study Hours (Overall) / Total Units (Overall): Hours: 2, Units: 4

7. Course Coordinator(s):

Name: Assistant Ahmed Talib Sabar

Email: ahmed.s.m.o.j@tu.edu.iq

Course Objectives

- Understanding different types of curricula.

- Identifying the components of the curriculum.

- Comprehending various teaching methods.

- Understanding daily, term, and annual lesson plans.

Teaching and Learning Strategies

- Strategy: Lecturing to students, engaging in discussions, posing and answering questions.

Course Structure

Week	Hours	Learning	Unit/Topic	Teaching	Assessment
		Outcomes	Name	Method	Method
1	3	Understand,	Concept of	Lecturing and	Daily and
		analyze,	Curriculum	guided	monthly
		synthesize		exploration	tests,
					assignments
2	3	Understand,	Old	Lecturing and	Daily and
		analyze,	Curriculum	guided	monthly
		synthesize		exploration	tests,
					assignments
3	3	Understand,	Modern	Lecturing and	Daily and
		analyze,	Curriculum	guided	monthly
		synthesize		exploration	tests,
					assignments
4	3	Understand,	Foundations	Lecturing and	Daily and
		analyze,	of Curriculum	guided	monthly
		synthesize	Building	exploration	tests,
					assignments
5	3	Understand,	Philosophical	Lecturing and	Daily and
		analyze,	Foundations	guided	monthly

		synthesize		exploration	tests,
					assignments
6	3	Understand,	Psychological	Lecturing and	Daily and
		analyze,	Foundations	guided	monthly
		synthesize		exploration	tests,
7	3	Understand,	Methods of	Lecturing and	assignments Daily and
'	3	analyze,	Curriculum	guided	monthly
		synthesize	Organization	exploration	tests,
		3,111103120	O'Bamzation	expression.	assignments
8	3	Understand,	Social	Lecturing and	Daily and
		analyze,	Foundations	guided	monthly
		synthesize		exploration	tests,
					assignments
9	3	Understand,	Cognitive	Lecturing and	Daily and
		analyze,	Foundations	guided	monthly
		synthesize		exploration	tests,
10	2	l loodt	Commission	I a atomica e e e	assignments
10	3	Understand,	Curriculum Elements or	Lecturing and	Daily and
		analyze, synthesize	Components	guided exploration	monthly tests,
		391111123122	Components	exploration	assignments
11	3	Understand,	Standards and	Lecturing and	Daily and
		analyze,	Characteristics	guided	monthly
		synthesize	of Educational	exploration	tests,
			Goals		assignments
12	3	Understand,	Content	Lecturing and	Daily and
		analyze,		guided	monthly
		synthesize		exploration	tests,
12			- I.		assignments
13	3	Understand,	Teaching Methods and	Lecturing and	Daily and
		analyze, synthesize	Tools	guided exploration	monthly tests,
		Synthesize	10015	exploration	assignments
14	3	Understand,	Evaluation	Lecturing and	Daily and
		analyze,	Process	guided	monthly
		synthesize		exploration	tests,
					assignments
15	3	Understand,	Textbooks and	Lecturing and	Daily and
		analyze,	Curriculum	guided	monthly
		synthesize		exploration	tests,
16					assignments
16	3	Understand,	Types of	Lecturing and	Daily and
		analyze, synthesize	School Curricula	guided exploration	monthly
		Symmesize	Curricula	exhiniarinii	tests, assignments
17	3	Understand,	Subject-	Lecturing and	Daily and
		analyze,	Centered	guided	monthly
		synthesize	Curriculum	exploration	tests,
		,	and Broad		assignments
			Fields		_
			Curriculum		
18	3	Understand,	Activity-Based	Lecturing and	Daily and
		analyze,	Curriculum	guided	monthly

		synthesize	and Core	exploration	tests,
		3,1161163126	Curriculum	CAPIOIUGOII	assignments
19	3	Understand,	Units	Lecturing and	Daily and
		analyze,	Curriculum	guided	monthly
		synthesize	Carriculatii	exploration	tests,
		3yrreriesize		CAPIOI delloii	assignments
20	3	Understand,	Teaching as	Lecturing and	Daily and
		analyze,	Art and	guided	monthly
		synthesize	Science	exploration	tests,
		3,1101103120	Joierroe	exploration	assignments
21	3	Understand,	Teaching	Lecturing and	Daily and
		analyze,	Methods	guided	monthly
		synthesize		exploration	tests,
		'			assignments
22	3	Understand,	Types of	Lecturing and	Daily and
		analyze,	Teaching	guided	monthly
		synthesize	Methods	exploration	tests,
					assignments
23	3	Understand,	Specific	Lecturing and	Daily and
		analyze,	Teaching	guided	monthly
		synthesize	Methods	exploration	tests,
					assignments
24	3	Understand,	Group	Lecturing and	Daily and
		analyze,	Discussion	guided	monthly
		synthesize	Method	exploration	tests,
					assignments
25	3	Understand,	Questioning	Lecturing and	Daily and
		analyze,	Method	guided	monthly
		synthesize		exploration	tests,
				<u> </u>	assignments
26	3	Understand,	Problem-	Lecturing and	Daily and
		analyze,	Solving	guided	monthly
		synthesize	Method	exploration	tests,
27			Desired S		assignments
27	3	Understand,	Project-Based	Lecturing and	Daily and
		analyze,	Method	guided	monthly
		synthesize		exploration	tests,
28	3	Understand,	Cooperative	Lecturing and	assignments Daily and
20	3	analyze,	Learning	guided	monthly
		synthesize	Learning	exploration	tests,
		39111111111212121		CAPIOLATION	assignments
29	3	Understand,	Programmed	Lecturing and	Daily and
23		analyze,	Learning	guided	monthly
		synthesize	200.711116	exploration	tests,
		3,		2	assignments
30	3	Understand,	Computer-	Lecturing and	Daily and
		analyze,	Based	guided	monthly
		synthesize	Learning	exploration	tests,
		7,		3.10.0.000	assignments
[I	I	200.011110110

Course Assessment

- Monthly Exam Scores: 50

- Final Exam Score: 50	
Learning and Teaching Resources - Prescribed Textbooks: Curricula and Teaching Methods for Primary Grades.	
- Main References (Sources): None specified.	
- Recommended Supporting Books and References (e.g., journals, reports): None specified.	

1- Course name

Nuclear Physics/ Fourth Stage

2- Course code / ATP023

Bachelor's

3- Semester / year

7.75/7.75

4- Date this description was prepared

7.77/9/7

5- Available attendance forms

Day

6- Number of study hours (total) / number of units (total)

90 hour

7- Name of the course administrator (if more than one name is mentioned)

Name:- Prof. Dr:- Asmaa Ahmed Aziz , Email:- asmaa.jamal@tu.edu.iq

8- Course objectives

Objectives of the study subject

- •Basic Concepts of Nuclear Physics
 - •Basic Properties of Nuclei
- •Dynamic Properties of Nuclei
- •Nuclear Structure
- •Shell Model
- •Shell Model with Spin-Orbit Coupling
- •Nuclear Interactions
- Elementary Particles in Nuclear Physics.

9- Teaching and learning strategies

Strategy

Lecture style, discussing with students, and asking and exchanging questions with students

10- Course Structure

Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	3	Basic properties of the nucleus	Basic concepts	Lecture	Daily and monthly exams, assignments and reporting
Second	3	The nucleus of the mirror	Basic concepts	Lecture	Daily and monthly exams,

					assignments
					and reporting
Third	3	Some units used in	Basic concepts	Lecture	Daily and
I III u		nuclear physics	Dusic concepts	Lecture	monthly
		nuclear physics			exams,
					assignments
					_
Fourth	3	Atomic mass unit	Atomic mass	Lecture	and reporting
rourtn	3			Lecture	Daily and
		y	unit		monthly
					exams,
					assignments
7710/1	2			-	and reporting
Fifth	3	Constant	Constant	Lecture	Daily and
		properties of the	properties of		monthly
		nucleus Constant	the nucleus		exams,
		properties of the			assignments
		nucleus			and reporting
Sixth	3	Nuclear stability	Nuclear	Lecture	Daily and
		study	stability study		monthly
					exams,
					assignments
					and reporting
Seventh	3	Kinetic properties	Kinetic	Lecture	Daily and
		of nuclei	properties of		monthly
			nuclei		exams,
					assignments
					and reporting
Eighth	3	radioactivity	Assumptions of	Lecture	Daily and
Eight.		i ttalotteti vity	radioactivity	Lecture	monthly
			i udiouctivity		exams,
					assignments
					and reporting
Ninth	3	Assumptions of	Assumptions of	Lecture	Daily and
MIII	3	the Properties of	the Properties	Lecture	monthly
		different rays	of different rays		_
		unierent rays	of unferent rays		exams,
					assignments
Т41.	2	IV	17	T4	and reporting
Tenth	3	Knowing the	Knowing the	Lecture	Daily and
		nuclear properties	nuclear		monthly
		of radiation	properties of		exams,
			radiation		assignments
***		, , , , , ,	y y	.	and reporting
Eleventh	3	nuclear binding	nuclear binding	Lecture	Daily and
		energ	energy		monthly
					exams,
					assignments
					and reporting
Twelfth	3	Radioactive decay	Radioactive	Lecture	Daily and
		law	decay law		monthly
			-		exams,
					assignments
					and reporting
Thirteenth	3	Interaction of	Interaction of	Lecture	Daily and

					41.1
		types of rays with	types of rays		monthly
		matter	with matter		exams,
					assignments
					and reporting
Fourteenth	3	Alpha and beta	Alpha and beta	Lecture	Daily and
		interactions with	interactions		monthly
		matter	with matter		exams,
					assignments
					and reporting
Fifteenth	3	Interactions of	Interactions of	Lecture	Daily and
		gamma rays and	gamma rays		monthly
		x-rays with matter	and x-rays with		exams,
		tter	matter		assignments
					and reporting
Sixteenth	3	Types of nuclear	Types of	Lecture	Daily and
~11100 C11011		detectors	nuclear		monthly
		uctetto15	detectors		exams,
			detectors		assignments
					and reporting
Seventeenth	3	Learn about	Learn about	Lecture	Daily and
Seventeentii	3	nuclear reactions	nuclear	Lecture	monthly
		nuclear reactions	reactions		_
			reactions		exams,
					assignments
T: 14 41		N.T. 1 00 0	NT 1 00 1	T 4	and reporting
Eighteenth	3	Nuclear fission	Nuclear fission	Lecture	Daily and
		and fusion	and fusion		monthly
					exams,
					assignments
					and reporting
Nineteenth	3	Nuclear reactors	Nuclear	Lecture	Daily and
			reactors		monthly
					exams,
					assignments
					and reporting
Twentieth	3	Natural	Natural	Lecture	Daily and
		radioactive chains	radioactive		monthly
			chains		exams,
					assignments
					and reporting
Twenty-one	3	Ionizing and non-	Ionizing and	Lecture	Daily and
	-	ionizing radiation	non-ionizing		monthly
			radiation		exams,
			- *************************************		assignments
					and reporting
Twenty-Two	3	Nuclear models	the Compton	Lecture	Daily and
1 wenty-1 wu	3	TAUCICAL HIUUCIS	effect	Lecture	monthly
			Nuclear models		
			inuclear infodels		exams,
					assignments
(D) 4 (D)		T	T · · · · · · ·	Τ .	and reporting
Twenty-Three	3	Liquid drop model	Liquid drop	Lecture	Daily and
			model		monthly
					exams,
					assignments

					and reporting
Twenty-Four	3	nuclear shell	nuclear shell	Lecture	Daily and
		model	model		monthly
					exams,
					assignments
					and reporting
Twenty-Five	3	Learn about	Learn about	Lecture	Daily and
		uranium	uranium		monthly
					exams,
					assignments
					and reporting
Twenty-Six	3	Enriched and	Enriched and	Lecture	Daily and
		depleted uranium	depleted		monthly
			uranium		exams,
					assignments
					and reporting
Twenty-Seven	3	Nuclear radiation	Nuclear	Lecture	Daily and
		hazards	radiation		monthly
			hazards		exams,
					assignments
					and reporting
Twenty-eight	3	Basic rules for	Basic rules for	Lecture	Daily and
		dealing with	dealing with		monthly
		radiation	radiation		exams,
					assignments
					and reporting
Twenty-nine	3	Nuclear	Nuclear	Lecture	Daily and
		elementary	elementary		monthly
		particles	particles		exams,
					assignments
					and reporting
Thirty 1	3	Classification of	Classification of	Lecture	Daily and
		elementary	elementary		monthly
		particles	particles		exams,
					assignments
					and reporting

11- Course Evaluation					
core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35 Final exam score: 50					
12- learning and Teaching Resources					
Required textbooks (methodology, if any)	Concepts in Nuclear physics				
Main references (sources)	Concepts in Nuclear physics /				
Recommended supporting books and	Nothing				

Electronic references, Internet sites General physics websites		
	references (scientific journals, reports) Electronic references, Internet sites	General physics websites

1. Course Name:						
English Language / 4 th Stage						
2. Course	Code:					
Undergrad	luate					
3. Semeste	er / Year:					
2023- 20)24					
_	tion Prep	aration Date:				
5/ 9/ 2023						
_	le Attenda	ance Forms:				
Daily						
	of Credit	t Hours (Total) / Number of U	Jnits (Total)		
60 hours						
7. Course a	ıdministra	ator's name (mention all, if me	ore than one	e name)		
Name: Assist. Teacher: Rola Fawwaz Hammad Email: rula.f.hamma tu.edu.iq 8. Course Course Objecti	Objectiv	/es	l □ stu	anguage dying som dying some	e basics of En te tenses e English style	
			speak	· ·	na nhweical ta	rms
• studying some physical terms 9. Teaching and Learning Strategies						
Strategy Lecture style, discussing with students, and asking questions to students						
10. Course Structure						
Week	Hours	Required Learning	Unit or su	ibject	Learning	Evaluation
		Outcomes	name		method	method
First	2	Learn what is the basics	Basics of	English	Lecture	Daily test

of English Language

Second	2	How and when this tense	Present perfect	Lecture	Monthly
		is used	simple tense		exam
Third	2	Training for reading	Reading	Lecture	Daily
					listening
Fourth	2	How and when this tense	Present perfect	Lecture	Monthly
1 0 001 001		is used	continuous tense	200000	& daily
					exam
Fifth	2	How this style is used	3 rd conditional	Lecture	Monthly
			(If clause)		& daily
					exam
Sixth	2	How to use this style	Present perfect	Lecture	Monthly
			passive		& daily
					exam
Seventh	2	How to use this style	Making Requests	Lecture	Monthly
					& daily
					exam
Eighth	2	Students' Evaluation	First exam	Lecture	Monthly
					exam
Ninth	2	Knowing some physical	Terms	Lecture	Quiz
		terms			
Tenth	2	Training for Speaking	Speaking	Lecture	Daily
					participants
Eleventh	2	Training for reading	Reading	Lecture	Daily
					participants
Twelfth	2	How to read decimal	Reading decimals	Lecture	Monthly
		numbers			& daily
					exam
Thirteenth	2	How to read years	Reading years	Lecture	Monthly
					& daily
					exam
Fourteenth	2	Knowing the time	Telling the time	Lecture	Monthly
					& daily
					exam

Fifteenth	2	What is the difference	Adjectives&	Lecture	Monthly
		between adv. & adj.	adverbs		& daily
					exam
Sixteenth	2		Second exam	Lecture	Monthly
					exam
Seventeenth	2	Training for writing	Story time	Lecture	Monthly
					& daily
					exam
Eighteenth	2	Knowing some	Definitions	Lecture	Monthly
		definitions			& daily
					exam
Nineteenth	2	How to use this style	Comparative	Lecture	Monthly
					& daily
					exam
Twentieth	2	How to use this style	Superlative	Lecture	Monthly
					& daily
					exam
Twenty first	2	Knowing such a style in	Suggestions	Lecture	Monthly
		2 nd language			& daily
					exam
Twenty	2	Students' Evaluation	Third Exam	Lecture	Monthly
second					exam
Twenty third	2	Knowing the Meaning of	Physical terms	Lecture	Monthly
		some terms			& daily
					exam
Twenty	2	Reinforcement students'	Vocabulary	Lecture	Monthly
fourth		knowledge of vocabulary			& daily
					exam
Tyronta C.O.	2	Dainformant to 1	Cym on year a	Lastre	Mon41,1
Twenty fifth	2	Reinforcement students'	Synonyms	Lecture	Monthly
		knowledge			& daily
					exam

Twenty sixth	2	Reinforcement students'	Antonyms	Lecture	Monthly
		knowledge			& daily
					exam
Twenty	2	Reinforcement students'	Matching	Lecture	Monthly
seventh		knowledge			& daily
					exam
Twenty	2	Identifhy some English	Permission	Lecture	Monthly
eighth		techniques for speaking			& daily
					exam
Twenty	2		Review	Lecture	
ninth					
Thirtieth	2	Students' Evaluation	Fourth Exam	Lecture	Monthly
					exam

1- Course name Quantum mechanics / fourth stage 2- Course code / QUP014 Bachelor's 4- Semester / year 2023-2024 **4-** Date this description was prepared 3/9/2023 **5-** Available attendance forms Day **6-** Number of study hours (total) / number of units (total) 90 hour 7- Name of the course administrator (if more than one name is mentioned) Name: - Assist. Prof. Dr: - Qahtan Nofan Abdullah , Email: - qahtan.nu@tu.edu.iq **8-** Course objectives Objectives of the study subject • Learn about quantum mechanics. • Study the failures of classical physics in explaining some physical phenomena. • Study the wave function. • Study of operators influences • Study of the time-dependent and timeindependent Schrödinger equation • Study the problem of a free particle and a particle confined in a potential well in one, two, and three dimensions • Harmonic oscillator • Study the issue of the hydrogen atom.. • Angular momentum

Lecture style, discussing with students, and

9- Teaching and learning strategies

Strategy

asking and ex	changing	questions	with
students			

10- Course Str	ucture				
Week	Hours	Required learning	Name of the unit or topic	Learning method	Evaluation method
		outcomes			
First	3	Basic concepts	Classical	Lecture	Daily and
			physics		monthly
					exams,
					assignments
C 1	2	D : 4	Cl. : 1	T 4	and reporting
Second	3	Basic concepts	Classical	Lecture	Daily and
			physics		monthly exams,
					assignments
					and reporting
Third	3	Basic concepts	Classical	Lecture	Daily and
1 1111 4		and concepts	physics	2000	monthly
			r J		exams,
					assignments
					and reporting
Fourth	3	Learn about	Introduction to	Lecture	Daily and
		quantum	quantum		monthly
		mechanics	mechanics		exams,
					assignments
					and reporting
Fifth	3	Learn about	D 4. 6	Lecture	Daily and
		quantum	Properties of		monthly
		mechanics	the wave		exams,
			the wave		assignments and reporting
			function		and reporting
			S		
Sixth	3	Learn about	Time-	Lecture	Daily and
		quantum	dependent		monthly
		mechanics	Schrödinger		exams,
			equation		assignments
					and reporting
Seventh	3	Learn about	Time-	Lecture	Daily and
		quantum	Independent		monthly
		mechanics	Schrödinger		exams,
			equation		assignments
Fighth	3	Idon4:fv 4h a	Substitutive	Lastres	and reporting
Eighth	3	Identify the characteristics	and non-	Lecture	Daily and monthly
		of operators	substitutive		exams,
		or operators	operators		assignments
			operators		and reporting
Ninth	3		Expected	Lecture	Daily and
			values		monthly

					exams,
		Learn about			assignments
					and reporting
		calculating			
		physical			
		observations			
Tenth	3		Expected	Lecture	Daily and
		Learn about	values		monthly
		calculating			exams,
		calculating			assignments and reporting
		physical			ame repereng
		observations			
		observations			
Eleventh	3	Herzberg's	Learn about	Lecture	Daily and
	-	principle of	Herzberg's		monthly
		inaccuracy	principle of		exams,
			inaccuracy		assignments
Twelfth	3	The problem of	free particle	Lecture	and reporting Daily and
2 // 0.220.2	•	a free particle	aree pureree	Zeevare	monthly
		and a particle			exams,
		trapped in a			assignments
		potential well			and reporting
Thirteenth	3	The problem of	a particle	Lecture	Daily and
		a free particle	trapped in a		monthly
		and a particle	potential well in 1-D		exams,
		trapped in a potential well	IN 1-17		assignments and reporting
		potential wen			and reporting
Fourteenth	3	The problem of	a particle	Lecture	Daily and
		a free particle	trapped in a		monthly
		and a particle trapped in a	potential well in 2-D		exams, assignments
		potential well	2 D		and reporting
7700				_	
Fifteenth	3	The problem of	a particle	Lecture	Daily and
		a free particle and a particle	trapped in a potential well		monthly exams,
		trapped in a	in 3-D		assignments
		potential well			and reporting
Sixteenth	3		Solved	Lecture	Daily and
		Examples of a	Examples		monthly
		particle			exams,
		particle			assignments and reporting
			1	l	and reporting

Т					
		trapped in a			
		тиррей ш и			
		potential well			
Seventeenth	3	Simple	Solution to the	Lecture	Daily and
		harmonic	quantum		monthly
		oscillator	harmonic		exams,
			oscillator		assignments
			problem		and reporting
Eighteenth	3	Simple	Solution to the	Lecture	Daily and
	•	harmonic	quantum	2000	monthly
		oscillator	harmonic		exams,
			oscillator		assignments
			problem		and reporting
Nineteenth	3	Simple	Energy levels	Lecture	Daily and
		harmonic	and wave		monthly
		oscillator	functions of a		exams,
			quantum harmonic		assignments and reporting
			oscillator		and reporting
			oscinator		
Twentieth	3	Simple	Energy levels	Lecture	Daily and
		harmonic	and wave		monthly
		oscillator	functions of a		exams,
			quantum		assignments
			harmonic		and reporting
			oscillator		
Twenty-one	3	Simple	normalization	Lecture	Daily and
1 wenty one		harmonic	of the wave	Lecture	monthly
		oscillator	functions of the		exams,
			harmonic		assignments
			oscillator		and reporting
					1
Twenty-Two	3	Simple	Solve examples	Lecture	Daily and
		harmonic	of quantum		monthly
		oscillator	harmonic		exams,
			oscillator		assignments
Twonty Thus	3	Undragon store	Sphorically	Lecture	and reporting
Twenty-Three	J	Hydrogen atom	Spherically Symmetrical	Lecture	Daily and monthly
			Potential Potential		exams,
			- 5151111111		assignments
					and reporting
Twenty-Four	3	Hydrogen atom	Solution of the	Lecture	Daily and
			Differential		monthly
			Equations		exams,
					assignments
					and reporting
Twenty-Five	3	Hydrogen atom	TP1 11	Lecture	Daily and
			Three-variable		monthly

			wave function		exams, assignments and reporting
Twenty-Six	3	Hydrogen atom	Structure of the hydrogen atom	Lecture	Daily and monthly exams, assignments
				.	and reporting
Twenty-Seven	3	Hydrogen atom	The diagonal function of the	Lecture	Daily and monthly exams, assignments and reporting
			hydrogen atom and the overall		and reporting
			wave function		
Twenty-eight	3	Hydrogen atom	electron spin	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	3	Hydrogen atom	Knowledge of basic quantum numbers	Lecture	Daily and monthly exams, assignments and reporting
Thirty	3	Hydrogen atom	Knowledge of basic quantum numbers	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation				
core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35 Final exam score: 50				
12- learning and Teaching Resources				
Required textbooks (methodology, if any)	Introduction to quantum mechanics			
Main references (sources)	Concepts in modern physics / written by Erth Pizer			
Recommended supporting books and	Nothing			
references (scientific journals, reports)				
Electronic references, Internet sites	General physics websites			

1- Course name Solid State physics / Fourth stage 2- Course code Bachelor's 3- Semester / year 7.75/7.78 **4-** Date this description was prepared 7.74/9/4 **5-** Available attendance forms Day **6-** Number of study hours (total) / number of units (total) 90 hour 7- Name of the course administrator (if more than one name is mentioned) Name:- Assist. Prof. Dr. Ayed N. Saleh , Email:- ayed.ns@tu.edu.iq **8-** Course objectives Objectives of the study subject • Identify the nature of matter and the properties of molecules. 9- Teaching and learning strategies Lecture style, discussing with students, and Strategy

10- Course Structure

10 Course St	10- Course Structure					
Week	Hours	Name of the	Required	Learning	Evaluation	
		unit or topic	learning	method	method	
		1	outcomes			
First	3	Atomic structure	Basic concepts	Lecture	Daily and	
					monthly	
					exams,	
					assignments	
					and reporting	
Second	3	periodic table	Basic concepts	Lecture	Daily and	
					monthly	
					exams,	
					assignments	
					and reporting	
Third	3	Crystallography	geometric	Lecture	Daily and	
			crystallography		monthly	
					exams,	

asking and exchanging questions with students

					assignments
					and reporting
Fourth	3	Crystallography	Physical	Lecture	Daily and
			crystallography		monthly
					exams,
					assignments
					and reporting
Fifth	3	Crystallography	Transitional	Lecture	Daily and
			vectors	20000010	monthly
			, , , , , , , , , , , , , , , , , , , ,		exams,
					assignments
					and reporting
Sixth	3	Crystallography	Cell unit	Lecture	Daily and
		or journography	con unit	Lecture	monthly
					exams,
					assignments
					and reporting
Seventh	3	Bonds	Material	Lecture	Daily and
Seventii	3	Donus	classification	Lecture	monthly
			Classification		exams,
					assignments
					_
Fighth	3	Bonds	naaking mathad	Lastura	and reporting
Eighth	3	Bonus	packing method	Lecture	Daily and
					monthly
					exams,
					assignments
NT: 41	2	D 1	T 44*	Τ .	and reporting
Ninth	3	Bonds	Lattice energy	Lecture	Daily and
					monthly
					exams,
					assignments
TF 41	2	D 1	тт •	T 4	and reporting
Tenth	3	Bonds	Harmonious	Lecture	Daily and
			number		monthly
					exams,
					assignments
		VY 1400 .4			and reporting
Eleventh	3	X-ray diffraction	Generation of	Lecture	Daily and
			rays		monthly
					exams,
					assignments
			¥=4.5		and reporting
Twelfth	3	X-ray diffraction	Filters	Lecture	Daily and
					monthly
					exams,
					assignments
					and reporting
Thirteenth	3	X-ray diffraction	Barak's Law	Lecture	Daily and
					monthly
					exams,
					assignments
					and reporting
Fourteenth	3	X-ray diffraction	Experimental	Lecture	Daily and

			mothod.		m antla1
			methods		monthly
					exams,
					assignments
					and reporting
Fifteenth	3	X-ray diffraction	laue derivation	Lecture	Daily and
					monthly
					exams,
					assignments
					and reporting
Sixteenth	3	X-ray diffraction	Reciprocal lattice	Lecture	Daily and
					monthly
					exams,
					assignments
					and reporting
Seventeenth	3	X-ray diffraction	Engineering	Lecture	Daily and
			construction		monthly
					exams,
					assignments
					and reporting
Eighteenth	3	Crystalline	Point defects	Lecture	Daily and
Eighteenth	3	defects	1 omit defects	Lecture	monthly
		ucicus			exams,
					-
					assignments
N:4 41-	2	C4-11:	I -44° J - C 4 -	T4	and reporting
Nineteenth	3	Crystalline	Lattice defects	Lecture	Daily and
		defects			monthly
					exams,
					assignments
			7.400		and reporting
Twentieth	3	Crystalline	Diffusion	Lecture	Daily and
		defects			monthly
					exams,
					assignments
					and reporting
Twenty-one	3	Crystalline	Fick's Law	Lecture	Daily and
		defects			monthly
					exams,
					assignments
					and reporting
Twenty-Two	3	lattice Vibrations	Sounic waves	Lecture	Daily and
					monthly
					exams,
					assignments
					and reporting
Twenty-Three	3	lattice Vibrations	atomic vibrations	Lecture	Daily and
				-	monthly
					exams,
					assignments
					and reporting
Twenty-Four	3	lattice Vibrations	Vibration modes	Lecture	Daily and
1 wenty-1 out	3	TATULE VIDIATIONS	v ini ation modes	Lecture	monthly
					•
					exams,
					assignments

					and reporting
Twenty-Five	3	Thermal	Classical theory	Lecture	Daily and
		properties			monthly
					exams,
					assignments
					and reporting
Twenty-Six	3	Thermal	Einstein's theory	Lecture	Daily and
		properties			monthly
					exams,
					assignments
					and reporting
Twenty-Seven	3	Electrical	Classical theory	Lecture	Daily and
		properties			monthly
					exams,
					assignments
					and reporting
Twenty-eight	3	Band Throry	Pierodic potential	Lecture	Daily and
					monthly
					exams,
					assignments
					and reporting
Twenty-nine	3	Semiconductor	Dopping of	Lecture	Daily and
			semiconductor		monthly
					exams,
					assignments
					and reporting
Thirty 1	3	Superconductivity	Superconductivity	Lecture	Daily and
			theory		monthly
					exams,
					assignments
					and reporting

11- Course Evaluation			
core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35 Final exam score: 50			
12- learning and Teaching Resources			
Required textbooks (methodology, if any)	Solid State physics		
Main references (sources)	Solid State physics / written by Yahaia N. Jamal		
Recommended supporting books and references (scientific journals, reports)	Nothing		
Electronic references, Internet sites	General physics websites		