Engineering Program

Specialization	**Common**
Course Number	**20201231**
Course Title	**Theory of machines**
Credit Hours	**2**
Theoretical Hours	**2**
Practical Hours	**0**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Introduction, linkages and mechanisms, cams, spur gears, .nonstandard spur gears, bevel, helical and worm gears, gear trains, velocity and acceleration analysis, force analysis of machinery, Blanca of machinery introduction to synthesis, governors, special mechanisms and robotics

Course Objectives:

Analyze the velocity and acceleration of the points in the different type of linkages

1. Distinguish between the static and dynamic balance of the machines.
2. Classify gears type and their notations.
3. Distinguish between the different linkages to transmit motion and power.
4. Analyze the force effecting on the governors.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Introduction to study mechanisms**	▪ Mechanisms machine ▪ Motion ▪ Cycle period and phase of motion ▪ Pairing elements ▪ Link. chain	
2.	**Linkages and mechanisms**	▪ Four bar linkage ▪ Slider crank mechanisms ▪ Scotch yoke ▪ Quick return acceleration ▪ Hooks coupling	
3.	**Velocity and acceleration**	▪ Linear and angular motion of particle ▪ Relative motion ▪ Graphical determination of velocity in mechanisms ▪ Instantaneous center of velocity ▪ Graphical determination of acceleration in mechanisms ▪ Relative acceleration of coincident particles on separate links carioles component of acceleration	
4.	**Cams**	▪ Disc cam with radial follower ▪ Disc cam with oscillating follower ▪ Cylinder cam ▪ Disc cam with redial roller follower	
5.	**Gear**	▪ Introduction to inviolate spur gear ▪ Spur gear detail ▪ Characterization of inviolate action ▪ Nonstandard spur gears ▪ Gear train ▪ Introduction to gear trains ▪ Planetary gear trains ▪ Applications of planetary trains	
6.	**Belts**	▪ Flat belt ▪ V- belt	
7.	**Balance of machinery and governors**	▪ Introduction ▪ Balance of rotors ▪ Dynamic and static balance ▪ Balancing machines ▪ Governors, types of governors	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	
	Second Exam	20%	
	Assignments	10%	
	Final Exam	50%	

Teaching Methodology:

1. Lecture
2. Power point presentation
3. Discussion

Text Books & References:

References:

1. Mechanisms and dynamics of machinery By Hamilton H. and Fred W. Ocvirk.
2. Theory of machines by R. S. Khurmi and J. K. GUPTA.

Engineering Program

Specialization	**Common**
Course Number	**20201232**
Course Title	**Theory of machines lab**
Credit Hours	**1**
Theoretical Hours	**0**
Practical Hours	**3**

Brief Course Description:

- This course give the student an opportunity to apply the theory gained within the theory of machines theoretical course through practical experimentation. Balancing motion transmission through mechanisms .speed changing and.

Course Objectives:

1. Classify types of motion.
2. Classify the linkages types.
3. Classify the gears types and their function.
4. Create balance testing for the rotating bodies.

Detailed Course Description:

lab Number	lab Name	lab Content	Time Needed
1.	Slider crank mechanisms (velocity and acceleration)		1
2.	Scotch yoke mechanisms (velocity and acceleration)		1
3.	Mass balance of rotating masses Gear box arrangement		1
4.	Friction in the belt		1

Evaluation Strategies:

Exams		Percentage	Date
Exams	Mid Exam	20%	
	Discussion of Sheets	30%	
	Final Exam	50%	

Teaching Methodology:

1. Laboratory

Text Books & References:

References:

1. Theory of machines by R.S Khurmi and J. K. Gupta.