Course Description Form

1. Course Name:
Analytical Mechanics
2. Course Code:
WBM-42-04
3. Semester / Year:
Semester
4. Description Preparation Date:
19/3/2024
5. Available Attendance Forms:
Presence in the classroom
6. Number of Credit Hours (Total) / Number of Units (Total)
30 h/ 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Hussain Ameer Aljawad Email: Hussein.aljawad@uowa.edu.iq
8. Course Objectives

Course Objectives	The course will cover fundamental concepts on the vibrations of mechanical systems including, simple harmonic motion, free and force of undamped and damped vibrations, rotating unbalance, support motion, vibration measuring instruments, two and multi degrees of freedom.

9. Teaching and Learning Strategies	
Strategy	1.Model real and physical dynamic systems in terms of mathematical models. 2. Apply principles of mechanical vibrations such as Newton's second law, and the principle of conservation of energy to the mathematical models to obtain their governing equations of motion. 3. Solve the obtained equations of motion to understand behavior of oscillatory systems to various excitations such as harmonic excitation, and impulse excitation.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1+2	2	Introduction to vibrations	Introduction to vibrations, Simple harmonic motion	Presented the lectures and explain it.	Daily exams + classwork
3-5	2	Free undamped vibrations	mathematical models, conservation of energy to the mathematical models	Presented the lectures and explain it.	Daily exams + classwork
6-8	2	Free damped vibrations	Solve the obtained equations of motion to understand behavior of oscillatory systems	Presented the lectures and explain it.	Daily exams + classwork
9	2	Force of undamped vibrations	Solve the obtained equations of motion with force to understand behavior of oscillatory systems	Presented the lectures and explain it.	Daily exams + classwork
10-12	2	Force of damped vibrations,	Force of damped vibrations, Vibration isolation and Force transmissibility, Rotating unbalance vibration, vibration measuring instruments	Presented the lectures and explain it.	Daily exams + classwork
13-15	2	Multi-degrees of freedom system	Two-degrees of freedom systems, Multi-degrees of freedom system	Presented the lectures and explain it.	Daily exams + classwork

11. Course Evaluation	
1- Theoretical lectures. 2- Discussion Tutorials. 3- Application in group to activate the team spirit at work	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Text book of Mechanical vibrations (2nd Ed) V. D. Rao.
Main references (sources)	Theory of vibration with applications (5-Ed), William T. Thomson
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	