



COURSE SPECIFICATIONS (CS)

Vibrations and waves

PHYS 232

June 2018

Course Specifications

Institution: King Saud University	Date of Report: Dec. 2017
College/Department Faculty of Science- Department of Physics and Astronomy	

A. Course Identification and General Information

1. Course title and code: Vibrations and waves (PHYS 232)			
2. Credit hours 3 (3+0+0) hours per week			
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Physics BSc degree			
4. Name of faculty member responsible for the course			
5. Level/year at which this course is offered		4 th semester / Second year	
6. Pre-requisites for this course (if any)		PHYS 111	
7. Co-requisites for this course (if any)		MATH 209	
8. Location if not on main campus Main campus in Diriyah , College of Science, Department of Physics & Astronomy			
9. Mode of Instruction (mark all that apply)			
a. traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="75"/>
b. blended (traditional and online)	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="25"/>
c. e-learning	<input type="checkbox"/>	What percentage?	<input type="text"/>
d. correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments:			

B Objectives

<p>1. What is the main purpose for this course?</p> <p>A. Knowing the fundamentals of vibration and waves in Physics, particularly: Physics of free vibrations – damping in in Physical phenomena – the physics of forced vibrations.</p> <p>B. Knowing the practical applications of vibration and waves.</p> <p>C. Gaining the attitude to improve his generic skills (knowledge – cognitive – interpersonal – communication – IT)</p> <p>D. Gaining the knowledge to manipulate the most useful instruments applying any of the studied mechanisms and precise the results.</p> <p>E. Gaining a standard level of solving problems and evaluating numbers.</p>
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)</p> <p>A. Explain strategy of the course in the beginning of the semester</p> <p>B. Outlines of the physical laws, principles and the associated proofs.</p> <p>C. Highlighting the day life applications whenever exist.</p> <p>D. Encourage the students to see more details in the international web sites and reference books in the library.</p> <p>E. Discussing some selected problems in each chapter.</p>

C. Course Description (Note: General description in the form used in Bulletin or handbook)

<p>Course Description:</p> <p>Periodic motion. Free Vibrations, mathematical and Fourier analysis. Super position of periodic motion. Sound, plasma, molecular and electrical circuit oscillations analysis. Damped vibrations, heavy light and critical damping. Forced Vibrations. Superposition. Transients. Resonance circuits. Waves: travelling, standing, dispersive and nondispersive. Fourier Theory.</p>
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1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Periodic motion, free vibrations (Simple Harmonic motion- SHM)	2	6
Simple Harmonic motion in physics; sound, plasma	2	6
Molecular and electric circuit oscillations analysis	1	3
Damped vibrations; Heavy, light and critical damping	2	6

Forced vibrations	2	6				
Superposition, transients	2	6				
Resonance circuits	1	3				
Waves; travelling, standing	1	3				
Dispersive and non-dispersive,	1	3				
Fourier theory	1	3				
2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	45		-	-		45
Credit	45					45

3. Additional private study/learning hours expected for students per week.	3
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	To recognize the physics of the vibrations and waves	Lectures	<ul style="list-style-type: none"> • Lectures • Discussion
1.2	To recognize the physics of free, forced vibrations and the Physics of Damping	Lectures	Exam Quizzes
1.3	To describe the physical principle or phenomena	Lectures Group Discussion	Exam Quizzes
2.0	Cognitive Skills		

2.1	To explain the day life applications of the studied topics	Group Discussion	Lectures Discussions
3.0	Interpersonal Skills & Responsibility		
3.1	<ul style="list-style-type: none"> • Write a report 	Lectures Discussion	Quizzes Exams
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	•		
4.0	Communication, Information Technology, Numerical		
4.1	Demonstrate problems- computation – data analysis – feeling physical reality of results.	Report Discussion	Portfolio Report. Exams
5.0	Psychomotor	not applicable	

6. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Quizzes	Weekly	10%
2	Homework	Weekly	10%
3	First Midterm Exam	6	20%
4	Second Midterm Exam	12	20%
5	Final Exam	16	40%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Office hours; 3 hours per week

E Learning Resources

1. List Required Textbooks

Vibrations and waves. By Ian G. Main, 3rd edition- Cambridge University press- 1998

الاهتزازات والموجات في الفيزياء. تأليف: أيان ج مين وترجمة: حمد عبد الله الهندي وعادل مجذوب حسيب، جامعة الملك سعود، 1999

2. List Essential References Materials (Journals, Reports, etc.)

- The physics of Vibrations and waves. By Pain H.J., Wiley & Sons, 1999
- Vibrations and waves. By Georg C.king, A John Wiley and Sons, Ltd., Publication, third edition, Great Brittan, 2009.

- ” الاهتزازات والأمواج ” مصطفى أفيني، فاطمة سروجي، جامعة حلب، سورية، حلب، 1419
- ” الاهتزازات ” أبو الحسن توني حسن، دار الفجر للنشر والتوزيع، الطبعة الأولى، القاهرة، 2003

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

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F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
<ul style="list-style-type: none"> • Lecture room for 30 students • Library
2. Computing resources (AV, data show, Smart Board, software, etc.)
<ul style="list-style-type: none"> • Computing resources (AV, data show, Smart Board, software, etc.) • Computer room • Scientific calculator
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
Data show projector

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> • Course evaluation by student • Students-faculty meetings
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
<ul style="list-style-type: none"> • Peer consultation on teaching • Departmental council discussions • Discussions within the group of faculty teaching the course
3 Processes for Improvement of Teaching
<ul style="list-style-type: none"> • Conducting workshops given by experts on the teaching and learning Methodologies. • Periodical departmental revisions of its methods of teaching. • Monitoring of teaching activates by senior faculty members.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Providing samples of all kind of assessment in the departmental course portfolio of each course.
- Assigning group of faculty members teaching the same course to grade same questions for various students. Faculty from other institutions are invited to review the accuracy of the grading policy.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The course material and learning outcomes are periodically reviewed and the changes to be taken are approved in the departmental and higher councils.
- The head of department and faculty take the responsibility of implementing the proposed changes.

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Field Experience Teaching Staff

Program Coordinator: _____

Signature: _____ Date Received: _____