

4/1/4. Course Specification:

COURSE SPECIFICATIONS Form

Course Title: Introduction to Curves and Singularities

Course Code: 4046106-4

Course Specifications

Institution: Umm Al-Qura University	Date: March 31, 2018
College/Department : Faculty of Applied Science – Department of Mathematical Sciences	

A. Course Identification and General Information

1. Course title and code: Introduction to Curves and Singularities 4046106-4			
2. Credit hours 4 hours			
3. Program(s) in which the course is offered: (If general elective available in many programs indicate this rather than list programs) Master in mathematics (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course Dr. Fawaz Allohaibi			
5. Level/year at which this course is offered: 2nd Year – 1st Semester(Elective course)			
6. Pre-requisites for this course (if any) : 4042501-4 + 4043404-3 + 4042601-3 + 4043403-3			
7. Co-requisites for this course (if any) : --			
8. Location if not on main campus Al-Abdia Campus and Alzahir Campus			
9. Mode of Instruction (mark all that apply):			
a. traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="100"/>
b. blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
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

1. What is the main purpose for this course? The course is intended to give an introduction to the ideas of modern singularity theory, using curves, families of curves and families of surfaces.
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) a) The course material is posted on the Web (CT) that could be accessed by the students enrolled in the course only. b) Students are encouraged to use online programs as one of computing resources . c) Use e-learning facilities more efficiently. Use computer packages for solving exercises

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

Course Description: This is a 4 credit hours course comprising approximately 60 hours of lectures.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Curves and functions on them	3	12
A_k singularities and change of variable.	2	8
Manifolds, diffeomorphisms, envelopes and Discriminants.	5	20
Versal unfoldings and pplications of unfoldings.	5	20

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	60	0				60
Credit	4	0				4

1. Additional private study/learning hours expected for students per week. Four hours weekly for homework and revision

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. <u>First</u>, 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.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge: After successful completion of the course, the student should be able to		
1.1	Define the related basic scientific facts, concepts, principles and techniques calculus	Lectures Tutorials Discussion Problem Solving	Exams Home work.
1.2	Recognize the relevant theories and their applications in basic mathematics.		
2.0	Cognitive Skills		
2.1	Representing problems mathematically.	Lectures Tutorials Solve Problem Brain Storming	Exams Quizzes. Home work. Discussion
2.2	How to distinguish different rules in singularity theory		
3.0	Interpersonal Skills & Responsibility		
3.1	Develop connections of singularity theory with other disciplines in Manifold theory	Coope rative education Competitive education	Home work. Reports. Quizzes. Discussion
3.2	Solve problems using a range of formats and approaches in basic science		
3.3	show the ability to work independently and within groups.		
4.0	Communication, Information Technology, Numerical		
4.1	Learn how to summarize lectures or to collect materials of the course.	Lectures tutorials brain storming	Home work. Reports. Discussion
4.2	Learn how to solve difficulties in learning: solving problems – enhance educational skills		
5.0	Psychomotor		
5.1	Not applicable	Not applicable	Not applicable

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	First periodic exam	6	20
2	Second periodic exam	10	20

4	Homework + reports + Quizzes	Over all weeks	20
5	Final exam	End	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)

1- Office hours per week in the lecturer schedule (6 hours per week).

2- Contact with students by e-mail, SMS, and e-learning facilities.

E Learning Resources

1. Required Text(s)

JW Bruce and P.J.Giblin, Curves and Singularities, Cambridge University Press, 1992

2. Essential References

Shihoko Ishii, Introduction to singularities, Springer Japan (2nd edition), 2018.

3. Recommended Books and Reference Material (Journals, Reports, etc) (Attach List):

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4. Electronic Materials, Web Sites etc

https://en.wikipedia.org/wiki/Singularity_theory

5. Other learning material such as computer-based programs/CD, professional standards/regulations: **Maple**

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 (Lecture rooms, laboratories, etc.)

- Classroom with capacity of 25-students.

- Library.

2. Computing resources: **Online programs and computer laboratory**

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list): --

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

Student feedback through electronic facilities organized by the deanship of registration and acceptance.

2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

(i) **Evaluation of the teachers by internal & external faculty members.**

(ii) **Visiting to the classrooms.**

(iii) **Mutual visits between colleagues and giving advices to each other after each lecture**

3 Processes for Improvement of Teaching

(i) **Analysis of student course evaluation and feedback**

<p>(ii) Peer evaluation and feedback</p> <p>(iii) Review of course portfolios</p> <p>(iv) Workshops on pedagogical methods</p>
<p>4. Processes for Verifying Standards of Student Achievement (eg. 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)</p> <p>Analysis of course assessments by other reviewers on a periodic basis.</p>
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <p>(i) Material and learning outcomes are periodically reviewed internally and externally.</p> <p>(ii) Comparing course content and teaching methodologies with similar courses offered at other departments and universities.</p> <p>(iii) Studying the outcomes of the students' evaluations of the course and use it to improve teaching strategies.</p>

Faculty or Teaching Staff: **Dr. Fawaz Alharbi** _____

Signature: _____ **Fawaz Alharbi** ___ Date Report Completed: _____

Received by: _____ Dean/Department Head

Signature: _____ Date _____