

T6. Course Specification (CS)

Institution	Najran University.	Date	5-7-1439
College/Department:	College of Science and Arts / Department of Mathematics		

A. Course Identification and General Information:

1. Course title and code:	Theorey of complex variable 383 Math-3
2. Credit hours :	Three hours.
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs)	College of Arts and Science Undergraduate Program (B.Sc. Mathematics)
4. Name of faculty member responsible for the course:	Dr. Hamoud Al-Haddad
5. Level/year at which this course is offered:	Level 7 / Fourth Year
6. Pre-requisites for this course (if any) :	Real Analysis (1) 281 Math-3
7. Co-requisites for this course (if any) :	None
8. Location if not on main campus:	The main campus in Najran (College of Arts and Sciences, Male- Female) The branch in Sharurah (College of Arts and Sciences, Male- Female)
9. Mode of Instruction (mark all that apply)	

a. Traditional classroom	<input type="text"/>	What percentage?	<input type="text"/>
b. Blended (traditional and online)	<input checked="" type="checkbox"/>	What percentage?	100%
c. e-learning	<input type="text"/>	What percentage?	<input type="text"/>
d. Correspondence	<input type="text"/>	What percentage?	<input type="text"/>
f. Other	<input type="text"/>	What percentage?	<input type="text"/>

B. Objectives

<p>1. What is the main purpose for this course?</p> <ul style="list-style-type: none"> To Performing basic algebraic operations on complex numbers. To connecting between the calculus of complex functions and real functions. To extending analytic function by serialized. To Comparing between Taylor and Laurant series of composite functions
<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> <ul style="list-style-type: none"> Review the plan at the Council of the department of each academic year for the purpose of development and improvement. Study the learning difficulties faced by students while studying the course. Measuring learning outcomes for students in the course. Update learning resources for course regularly using the Internet.

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

<p>Course Description :</p> <p>This course will cover the basics of complex analysis, such we will focus on algebraic processes on complex numbers and the representation of complex numbers, as well as basic complex functions, analytic functions, calculus of complex functions, and infinite series of complex functions and singular points</p>
--

1. Topics to be Covered:

List of Topics	No. of Weeks	Contact Hours
Complex Numbers (Algebraic Properties of Complex Numbers - Representation of the Cartesian - Polar Representation of Complex Numbers - Powers and Roots-De Moavar Theory).	3	9
Complex Functions (Single and Multivariate Variable Functions – Limits and continuity - Derivatives - Analytical Functions - Cauchy-Riemann Equations - Harmonic Functions)	3	9
Elementary Complex functions (exponential functions - logarithmic functions - trigonometric functions and hyperbolic functions).	3	9
Complex integration (integration of Complex functions dependent on a single variable – complex curve integrals - Green theory – Cauchy_Goarsat theorem – Caochy theorem integration	3	9
Series and Singularity Points (convergence of sequences and Series, Tyler series, Lorent series, residues theorem	3	9

1.Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or studio	Practical	Other:	Total
Contact Hours	45					45
Credit	3					3

3-Additional private study/learning hours expected for students per week

6

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).

Code	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge: By the end of the semester, the students will be able to		
1.1	Mention the basic properties of complex numbers.	Discussions through the lecture.	<ul style="list-style-type: none">homework,oral Exam
1.2	Determines the properties of complex trigonometric functions.		
1.3	Defines infinite series.		
2.0	Cognitive Skills : By the end of the semester, the students will be able to Training the student to		
2.1	Explains the method of finding derivatives of different complex functions	Problems solving method.	<ul style="list-style-type: none">Homework assignmentsExams
2.2	Gives different examples of analytical functions		
2.3	Prove basic theories in the calculation of complex integrals		
2.4	Solves multiple problems in complex analysis		
3.0	Interpersonal Skills & Responsibility: By the end of the semester, the students will be able to		
3.1	Classification the functions which able to derivative.	Discussions through the lecture.	<ul style="list-style-type: none">Homework assignmentsExams
3.2	Compares the power series of Taylor, McLaurin and Laurent		
4.0	Communication, Information Technology, Numerical:		
4.1	Show clearly The concepts of the theory of complex analysis	Cooperative Learning Method	<ul style="list-style-type: none">Homework assignmentsExams
5.0	Psychomotor:		
5.1	Not applicable	Not applicable	Not applicable

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, Quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	First exams	7	20 degrees

2	second exams	12	20 degrees
3	Homework + exercises within the lecture hall	From 1 to 15	10 degrees
4	Final exam	16	50 degrees

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)

- Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)
- Office hours for a faculty member for 3 hours weekly.
- Follow-up the instructions of the head of the department.

E. Learning Resources

1. List Required Textbooks:

- Dr. Mahmoud Mohammed Katkat, Fundamentals of complex analysis, Juhaina Lab., 2001

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

- 1 Spiegel, Complex Variables, Schum's Outline Series, McGraw-Hill Book Co (1979)..)
- 2 List Essential References Materials (Journals, Reports, etc.)
Rudin, W., Real and Complex Analysis, Mc Graw-Hill, New York, 1970.
2. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
3. Calculus with analytical geometry, Howard Anton, John Wiley & Sons

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

- <http://www.arab-math.com/forum/forumdisplay.php?f=7>
- <http://en.wikipedia.org/wiki/Mathematics>
- http://en.wikipedia.org/wiki/Complex_analysis

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

None

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.)

Lecture classroom with suitable seats

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Lecture classroom, smart board and projector (Data Show).

2. Computing resources (AV, data show, Smart Board, software, etc.) smart board and projector (Data Show).
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) None

G. Course Evaluation and Improvement Processes:

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching <ul style="list-style-type: none"> - Student Course Evaluation Survey at the end of the semester. - Follow-up over the performance and interaction of students with the course through attendance and tests.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the department. <ul style="list-style-type: none"> - Qualitative analysis of the results of the students. - Peer evaluation. - Student Course Evaluation Survey at the end of the semester - Applying the new system of Faculty staff members evaluation
3. Processes for Improvement of Teaching: <ul style="list-style-type: none"> - Follow up and apply new teaching strategies in this course.
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) <ul style="list-style-type: none"> - Check marking by an independent member teaching staff of a sample of student work
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement : <ul style="list-style-type: none"> • Review the contents of the course periodically. • Updating the Textbooks and references.

Name of instructor : **Dr. Hamoud Al-Haddad** _____

Signature : _____ Date Report Completed : **5-7-1439** _____

Name of field experience teaching staff : **None** _____

Program coordinator : **Dr. Hamoud Al-Haddad** _____

Signature: _____ Date received: **15-7-1439** _____