The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

Course Name

0301915   Complex analysis

1	Course title	Complex Analysis
2	Course number	0301915
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	Complex Analysis Master
5	Program title	PhD. In Mathematics
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Science
9	Department	Mathematics
10	Level of course	Compulsory specialization requirement
11	Year of study and semester (s)	2nd year, 1st semester
12	Final Qualification	PhD. In Mathematics
13	Other department (s) involved in teaching the course	--
14	Language of Instruction	English
15	Date of production/revision	20/10/2020

16. Course Coordinator:

A. Tallafha

17. Other instructors:

Prof. R khalil.

Prof. A. Usef.

18. Course Description:

Open mapping theorem. Positive harmonic functions. The phragmen-Lindelof method and interpolation. Approximation by rational functions. Runges theorem, Cauchy's theorem. Simply connected regions. Zeros of holomorphic functions, infinite products, the Muntz-Szasz theorem. Analytic continuation, Regular points and singular points, continuation along curve, The Picrd theorem. H^P- spaces(Hardy spaces), Subharmonic functions, the space H^P and N (Nevanlinna class), the theorem F. and M. Riez, factorization theorems, the shift operator, conjugate function.

19. Course aims and outcomes:

A- Aims: to understand the topics in the course and to know the most important application of these topics.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to …

B1. To know the open mapping theorem and it is applications
B2. To know The phragmen-Lindelof method and interpolation.
B3. To know Runges, Cauchy's and Muntz-Szasz theorem theorems.
B4. To find Regular and singular points of holomorphic functions
B5. To Know the structure of H^P- spaces(Hardy spaces).

20. Topic Outline and Schedule:

1.

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
1. Open mapping theorem	1		B1	Homework's and Exams	Alfors and Conway
2. Positive harmonic functions.	2		B2	Homework's and Exams	Alfors and Conway
3. The phragmen-Lindelof method and interpolation	3		B2	Homework's and Exams	Alfors and Conway
4. 4. Approximation by rational functions.	4		B2	Homework's and Exams	Alfors and Conway
5. Runges theorem,	5		B3	Homework's and Exams	Alfors and Conway
6. Cauchy's theorem. Simply connected regions.	6		B3	Homework's and Exams	Alfors and Conway
7. Zeros of holomorphic functions, infinite products, the Muntz-Szasz theorem.	7,8		B4	Homework's and Exams	Alfors and Conway
8. Analytic continuation, Regular points and singular points, continuation along curve,	9,10		B4	Homework's and Exams	Alfors and Conway
9. The Picrd theorem.	11		B4	Homework's and Exams	Alfors and Conway
10. H^P- spaces(Hardy spaces), Subharmonic functions, the space H^P and N (Nevanlinna class), the theorem F. and M. Riez, factorization theorems, the shift operator, conjugate function.	12,13, 14, 15		B5	Homework's and Exams	Alfors and Conway

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following <u>teaching and learning methods</u>:

In order to succeed in this course, each student needs to be an active participant in learning – both in class and out of class.

- Class time will be spent on lecture as well as discussion of homework problems and some group work.
- To actively participate in class, you need to prepare by reading the textbook and doing all assigned homework before class (homework will be assigned each class period, to be discussed the following period).
- You should be prepared to discuss your homework (including presenting your solutions to the class) at each class meeting - your class participation grade will be determined by your participation in this.

You are encouraged to work together with other students and to ask questions and seek help from the professor, both in and out of class.

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following <u>assessment methods and requirements</u>:

ILO/s	Learning Methods	Evaluation Methods	Related ILO/s to the program
	Lectures	Exam	
		Presentation	
		Homework	

23. Course Policies:

1. The student is not allowed to take the course and it's pre-requisite in the same time.
2. Attendance is absolutely essential to succeed in this course. You are expected to attend every class; please notify your instructor if you know you are going to be absent. All exams must be taken at the scheduled time. Exceptions will be made only in extreme circumstances, by prior arrangement with the instructor.
3. If a student is absent for more than 10% of lectures without an excuse of sickness or due to other insurmountable difficulty, then he/she shall be barred from the final examination also he/she will get a failing grade in this course.
4. Medical certificates shall be given to the University Physician to be authorized by him. They should be presented to the Dean of the Faculty within two weeks of the student's ceasing to attend classes.
5. Test papers shall be returned to students after correction. His/her mark is considered final after a lapse of one week following their return.
6. Solutions for the exams questions and marks will be announced at the webpage of the instructor: http://eacademic.ju.edu.jo/eabuosba/default.aspx

7. Cheating is prohibited. The University of Jordan regulations on cheating will be applied to any student who cheats in exams or on homework's.

24. Required equipment:

25. References:

Alfors, L.V. Complex analysis. McGraw-Hill, N. Y, 1979

Conway. Functions of one complex variable 2^{ed} edition. Springer Verlag, N.Y 1978

26. Additional information:

Name of Course Coordinator: Professor Khalil, R. Signature: -----------A.Tallafha-------- Date: 20/10/2020

 Head of curriculum committee/Department: ------------------------- Signature: ---------------------------------

Head of Department: ------------------------- Signature: ---------------------------------

Head of curriculum committee/Faculty: ------------------------- Signature: ---------------------------------

Dean: --- -Signature: ---------------------------------

<u>Copy to:</u>
Head of Department
Assistant Dean for Quality Assurance
Course File