



الجامعة الافتراضية السورية  
SYRIAN VIRTUAL UNIVERSITY

# Mathematical Analysis II Course

Course description

**I**nformation

**T**echnology

**E**ngineering



Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

### 1. Basic Information:

<b>Course Name</b>	Mathematical Analysis II
<b>Course ID</b>	BMA402
<b>No. of Recorded Sessions*</b>	10-12
<b>No. of Synchronized Sessions*</b>	10-12
<b>No. of Quizzes (hrs.)</b>	0
<b>Exam (hrs.)</b>	2
<b>Registered Sessions Work Load (hrs.)</b>	36
<b>Synchronized Sessions Work Load (hrs.)</b>	36
<b>Credit Hours</b>	5

\* The duration of each session 1.5 hr

### 2. Pre-Requisites:

Course	ID
Mathematical Analysis I	BMA401

### 3. Course Objectives:

This course exposes main concepts of mathematical analysis II. Topics include: sequence of functions, series of functions, improper integrals, Fourier series and transform, original functions and Laplace transform and its applications.

This course prepares students to apply the main concepts of mathematical analysis II in their domains of specialties: simple and uniform convergence of sequences and series of functions, continuity and derivation of the limit function, calculation of improper integrals, Fourier and Laplace transform.

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#### 4. Learning Outcomes (LO):

By the end of this course the learner is expected to:

- Understand simple and uniform convergence of sequences and series of functions.
- Understand the continuity and the derivation of functions defined by sum of series.
- Understand trigonometric series and its properties.
- Understand and calculate improper integrals and use comparison tests.
- Calculate Fourier transform and Laplace transform.
- Study different mathematical problems

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## 5. Assessment Results:

Chapter No.	Chapter Title	Intended Objectives	Assessment Type				
			Developed content/ Recorded Sessions	Practical Activities (Synchronized Sessions)	Quizzes and Exams	Presentations And Interviews	Reports HW
CH1	Sequence of functions	Understand simple and uniform convergence of sequence and series of functions.	X	X	X		X
CH2	Series of functions	Understand the continuity and the derivation of functions defined by sum of series.	X	X	X		X
CH3	Fourier series	Understand trigonometric series and its properties.	X	X	X		X
CH4	Improper integrals	Understand and calculate	X	X	X		X

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		improper integrals and comparison tests.					
<b>CH5</b>	Fourier transform	Calculate Fourier transform	X	X	X		X
<b>CH6</b>	Laplace transform	Calculate Fourier transform	X	X	X		X

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## 6. Course Syllabus

Chapter No.	Chapter Title	Chapter Content (Syllabus)	No. of Theoretical Learning Units	No. of Practical Learning Units)
CH1	Sequence of functions	<ol style="list-style-type: none"> <li>1. Simple convergence</li> <li>2. Uniform convergence</li> <li>3. Continuity</li> <li>4. Derivation</li> </ol>	2	2
CH2	Series of functions	<ol style="list-style-type: none"> <li>1. Simple and uniform convergence</li> <li>2. Convergence by norm</li> <li>3. Continuity and derivation</li> </ol>	2	2
CH3	Fourier series	<ol style="list-style-type: none"> <li>1. Trigonometric series</li> <li>2. Relation between coefficients and sum</li> <li>3. Fourier series</li> <li>4. Bessel and Parseval equation</li> </ol>	2	2
CH4	Improper integrals	<ol style="list-style-type: none"> <li>1. Definition</li> <li>2. Comparison tests</li> <li>3. Improper integrals and absolute convergence</li> </ol>	2	2
CH5	Fourier transform	<ol style="list-style-type: none"> <li>1. Definitions</li> <li>2. Hypothesis of existence</li> <li>3. Dirac function</li> <li>4. Fourier transform</li> </ol>	2	2

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		5. Wold decomposition		
CH6	Laplace transform	1. Definitions 2. Laplace transform properties 3. Convolution	2	2

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## 7. Practical Activity:

- Tools and Labs:

Tool Name	Description

- Practical Activities per Chapters:

Chapter	Practical Activity	Remarks
CH1	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Experiment <input type="checkbox"/> Other	
CH2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Experiment <input type="checkbox"/> Other	



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<b>CH3</b>	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Experiment <input type="checkbox"/> Other	
<b>CH4</b>	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Experiment <input type="checkbox"/> Other	
<b>CH5</b>	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Experiment <input type="checkbox"/> Other	
<b>CH6</b>	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Experiment <input type="checkbox"/> Other	

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## 8. References: