Estd 1864

Forman Christian College, Lahore
(A Chartered University)
Department of Mathematics

Instructor Information:

Name: Dr. Wasiq Hussain
Professor of Mathematics
Ph.D. (University of Glasgow, Scotland, U.K., 1999),
M.Phil. (Quaid-i-Azam University Islamabad, 1995)
M.Sc. (Quaid-i-Azam University Islamabad, 1993)

Office: **S 356** Armacost (Science) Building

Office Hours: 03:15 PM to 04:15 PM (Monday), 11:10 AM to 12:10 PM (Thursday)

The **students not on campus** could **contact via WHATSAPP GROUP**: **ODEs (Math 202) FALL 2021** preferably during the same office hours.

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Course Information:
(COURSE TRAILER LINK: https://youtu.be/9dj1g88ZkA0)

Title: Ordinary Differential Equations **Code:** Math 202 **Credits:** 3

Prerequisites: Math 102 (Calculus I) **Classroom:** S-413

Class Discussion Time: Monday, Wednesday, and Friday (11:00 AM - 11:50 AM)

Textbook: Applied Differential Equations by Murray R. Spiegel (2nd Edition), Prentice-Hall Mathematics Series (USA). **Soft Copy** of this book is also available at:

http://93.174.95.29/main/727D4A97DACCA9A2946105037F0A7875

PDF FILE of this **textbook** is **already UPLOADED** on **MOODLE**.

Course Objectives:

(1) Basic understanding of techniques to solve first and second order ordinary differential equations.
(2) To understand the logic (proof) behind a particular method and develop concepts and problems solving skills through lectures, class discussions and practice sessions for solving ordinary differential equations.

(3) Prepare students for higher level courses in applied mathematics and also non-math majors to study courses in Physics, Economics and Computer-Science.

Learning Outcomes:

At the end of the course students should have:

1) Good understanding of the different types of ordinary differential equations.

2) Course knowledge to creatively and critically develop problem-solving skills based on logical explanation.

3) Enough background to comfortably take higher level courses based on ordinary differential equations.

Course Requirements:

Students must arrive at class on time and **those coming after 15 minutes won't be allowed** unless there was an emergency and instructor was informed before the class. If there is a genuine reason for coming late and **not possible to inform the instructor then please stay outside**, class discussion could be done during office hours or by an appointment. **Inside** the **class room Mobile phones** will be **turned off** and **no one will sleep.**

According to the instructions from the higher authorities and COVID-19 situation we are going to **follow BASIC blended model** (**FLIPPED CLASSROOM**) in which we have **face-to-face sessions** that are **complimented** with **online material**/activities. **All** the **students** will **watch videos** (**My** Online **YOUTUBE LECTURES**) on **WEEKLY BASIS** available at: https://www.youtube.com/c/DrWasiqMathematicsUndergraduateLecturesMULTIMEDIA?sub_confirmation=1 in the **PLAYLIST** "**ORDINARY DIFFERENTIAL EQUATIONS**".
Then we shall **use class-time** for **discussions** and **questions**.

> **YouTube RECORDED Multimedia Lectures** have been **prepared** with **full detailed calculations** using **power-point presentations** having **animations**, pictures and **Cartoons**. **All** the **students MUST WATCH EVERY LECTURE** on **weekly basis before attending** the **face to face class discussion** or **online discussion**.
>
> In my course **ATTENDANCE** is **NOT Compulsory** for **Class discussions** but it is **strongly recommended** to **attend class sessions** for **discussions** and **questions after watching** the **online lecture seriously. Online lecture** could be **watched more than once** and you **definitely find** it **useful.**

Working regularly, understanding the online lectures, solving problem sets, **doing assignments (to be graded)** will be very helpful to get an overall good grade. **IN FACT IT IS VERY IMPORTANT TO CONCENTRATE ON GETTING THE KNOWLEDGE NOT JUST THE GRADE.**

You are most welcome to discuss the assignments (to be graded) with me (after seriously attempting) but NO CHEATING/COPYING as THREE CHEATING OFFENCES are still applicable. ONLY SOFT COPIES of ASSIGNMENTS will be acceptable. GRADED ASSIGNMENTS should be submitted via MOODLE or EMAIL. I understand that this is really a difficult time but LATE SUBMISSION may RESULTS in GRADE REDUCTION so PLEASE COOPERATE and AVOID LATE SUBMISSION.

(*Read Student handbook* **Pages 25-27** available at http://www.fccollege.edu.pk/wp-content/uploads/2012/09/Final-Bacc-Handbook-2012.pdf)**,** following are the **consequences** for **cheating**:

First offence: a grade of zero will be assigned to the paper, report, quiz or test. The student's final grade for the class must be reduced by *at least* one letter grade. **Case** will be **reported** to **Vice Rector**.

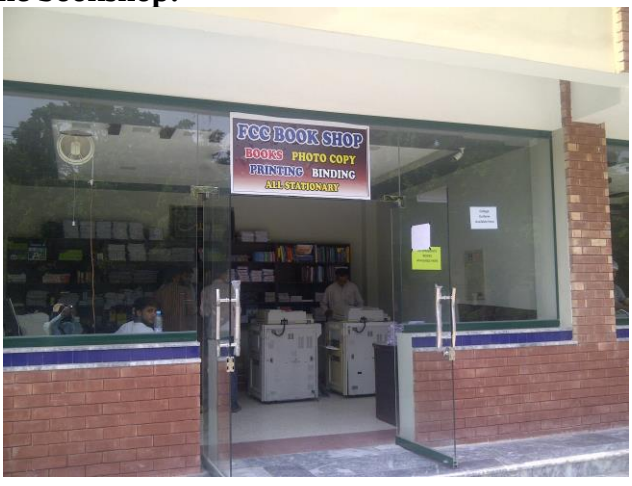
Second offence: an automatic dismissal from the course in which the second offence occurred with a resulting final grade of "F". **Case** will be **reported** to **Vice Rector**.

Third offence: the student will be called before an Academic Integrity Committee to show cause why the University should not suspend him or her. The Vice-Rector will convene such a hearing. **First offence** in **another course** will be **overall 3rd offence**, as **two already recorded before** that.

Technical Facilities:

Teaching will be done with the help of **RECORDED COLORFUL MULTIMEDIA YOUTUBE LECTURES,** for which**, important updates** will be **shared via Whatsapp and MOODLE**. **Soft Copies** (**Lectures**, **Problems Sets' Solutions, text book**) will be made **available via MOODLE**. *DUE TO COVID-19 SITUATION* **BUT BEARING IN MIND SAFETY MEASURES** *HARD COPIES* of Lectures and Problems Sets' Solutions *COULD BE OBTAINED FROM FCC BOOKSHOP*.

See the Picture of the bookshop:



Course Evaluation:

Grading will be based on following criteria (PROVIDED WE THROUGHOUT FOLLOW THE **BLENDED MODE**):

3 Assignments (**20% each, submit on MOODLE or via EMAIL**) **60%**

VIDEO ASSIGNMENT/PRESENTATION (RECORDED IN YOUR VOICE)
Duration: At least Minutes
(Submit on MOODLE or via GOOGLE DRIVE) 40%

Guidelines to do recording on MICROSOFT power-point 2010: (Procedure may vary in other versions)
(1) Open PowerPoint Presentation
(2) Click "FILE".
(3) Click "Save and Send"
(4) Click "Create Video"
(5) DON'T click "Don't Use Record Timings and Narrations"
(6) Click "Record timing and Narration" and "START RECORDING".
(7) Once the lecture is complete press "ENTER".
(8) Click "Use Recorded Timings and Narrations" and click "PREVIEW".
(9) If "PREVIEW" is correct then stop which means CLICK "X" and do step "4" and click "Create Video" and save with a different name.
(10) Don't save the actual file (which was made on power-point).

IMPORTANT NOTES:
(1) Never go back to previous slide otherwise recording of previous slide disappears.
(2) Don't speak at the change of slide or going to next slide.
(3) LASER POINTER: CTRL+LEFT MOUSE CLICK
(4) LASER POINTER STOPS as SLIDE CHANGES.

MORE GUIDE-LINES to make the Presentation Understandable:

(1) Information must be presented in a logical sequence.

(2) Introduction is attention-getting, lays out the problem well, and establishes a framework (structure) for the rest of the presentation.

(3) Presentation contains accurate information and must be communicated using correct vocabulary and grammar.

(4) Voice must be clear and audible.

(5) Delivery must be poised (balanced), controlled, and smooth.

(6) Good language skills and pronunciation should be used.

(7) Visual aids are well prepared, informative, effective, and not distracting.

(8) Length of presentation should be within the assigned time limits.

(9) Presentation guarantees that the student clearly understands the topic in-depth and presented his/her information convincingly.

(10) Video must be edited effectively.

NOTE:

Power-point presentation could also be **recorded** on **other soft-wares like ZOOM.**

Grades	Quality Points	Numerical Value	Meaning
A	4.00	93-100	Superior
A-	3.70	90-92	
B+	3.30	87-89	
B	3.00	83-86	Good
B-	2.70	80-82	
C+	2.30	77-79	
C	2.00	73-76	Satisfactory
C-	1.70	70-72	
D+	1.30	67-69	
D	1.00	60-66	Passing
F	0.00	59 or below	Failing

WEEKLY SCHEDULE

Week/Weeks (Starting Date)		Reading Material from Book
(1) 1st NOV.	1) Discussion of Course Plan (Physical and on Moodle) 2) Definitions and Classification of Differential Equations 3) Formation of Differential Equations.	 Pages: 4-6 Pages: 14-18

(2) **8th NOV.**	1) First Order Ordinary Differential Equation 2) Separable Equations	Page: 27 Pages: 36-38
(3) **15th NOV.**	1) Homogeneous Equations 2) Exact Equations **ASSIGNMENT NO. 1 (DUE DATE: 11th December)**	Pages: 46-49 Pages: 28-35
(4) **22nd NOV.**	1) Inexact Equations and Integrating Factors 2) First Order Linear Equations 3) Bernoulli Equations	Pages: 39-42 Pages: 43-44 Page: 45
(5) **29th NOV.**	Clairaut's Equation	Pages: 58
(6) **6th DEC.**	Second Order Linear Equations	Pages: 139-148
(7) **13th DEC.**	Linear Homogeneous Equations: the Wronskian **ASSIGNMENT NO. 2 (DUE DATE: 15th JAN.)**	Pages: 153-157
(8) **20th DEC.**	Non-homogeneous Equations	Page: 159

(9) **3rd JAN.**	The Method of Undetermined Coefficients	Pages: 160-167
(10) **10th JAN.**	Method of Variations of Parameters	Pages: 168-170
(11) **17th JAN.**	Euler's Differential Equation **ASSIGNMENT NO. 3 (DUE DATE: 12th FEB.)**	Pages: 180-183
(12) **24th JAN.**	Introducing the Laplace Transformation	Pages: 244-247
(13) **31st JAN.**	Properties of Laplace Transformation	Pages: 248-250
(14) **7th FEB.**	Inverse Laplace Transform and its Properties	Pages: 259-260
(15) **14th FEB.**	Solution of Ordinary Differential Equations using Laplace Transform	Pages: 261-264
(16) **21st FEB.**	**Final exams/assessments start. Date will be announced later.**	