Estd 1864

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

Instructor Information:

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The **students can** also **contact via** **WHATSAPP GROUP**: **ODEs (Math 202) Spring 2022** .

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Course Information:

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

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

Class Times: 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 10 minutes won't be allowed** unless there was an emergency and instructor was informed before the class. Students should remain in class for the entire class period and could only leave if there is an emergency but instructor must be informed in advance. If there is a genuine reason for coming late and **not possible to inform the instructor then please stay outside**, **lecture briefing will be given** and **average marks** of a **missed quiz** could be **given. Inside** the **class room Mobile phones** will be **turned off** and **no one will sleep.**

There is **no make up for missed quizzes** but *BEST **5** OUT OF **6** WILL BE COUNTED*. In extreme cases average marks for the missed quizzes might be given provided students should submit strong evidence **within 3 days** after missing the quiz. Make up for mid-term and final exam is possible only under extreme cases if student provides strong documentary evidence **within 3 days** after missing the Mid/Final. In case of make-up exam there will be a 0-20% deduction in marks depending upon case to case basis. **Medical Certificate** will be **acceptable** if it is **verified** by the **medical officer (mercy health centre)** of **FCC (A Chartered University)**.

We have **face-to-face sessions** that are **complimented** with **online material**/activities. **All** the **students** can also **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**".

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 LECTURES** on **weekly basis in addition to face to face class sessions** and **online discussion**.

It is **strongly recommended** to **attend class sessions** and **watch** the **online lectures seriously. Online lecture** could be **watched more than once** and you **definitely find** it **useful.**

Working regularly, understanding the lectures, solving problem sets (practice questions), 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.**

These steps have been taken to maintain discipline and making course understandable but not to put pressure on the students and to **avoid** using the illegal ways like **cheating** to pass the exams.

(*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**.

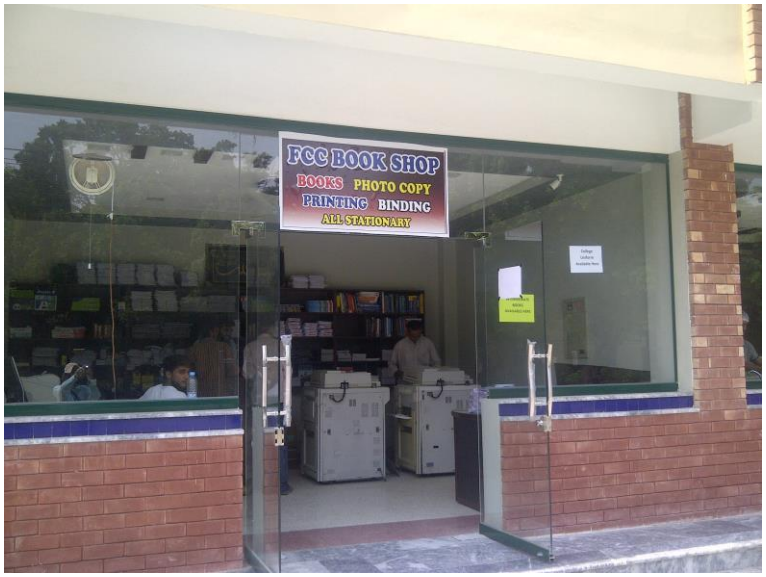
Third offence: the student will be called before an Academic Integrity Committee to show cause why the University should not suspend him or her. The Vice-Rector will convene such a hearing. **First offence** in **another course** will be **overall 3rd offence**, as **two already recorded before** that.

Technical Facilities:

Teaching will be done with the help of multimedia slides and there will be **no** need to copy notes *unless* asked to do so.

Please don't forget to watch the **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* **(Next** to **Students' Services and Cafeteria).**

See the Picture of the bookshop:



Task is that the time spent in writing on board will be saved in explaining the concepts and the time spent to copy from the board must be spent in understanding the concept. Please don't hesitate to ask where you don't understand and try your best to ask intelligent questions (showing that you paid attention). Students can save all the soft copies of course notes (Lectures and Practice Questions Solutions) on a pen drive.

Course Evaluation:

Grading will be based on following criteria (provided we remain face to face throughout the semester):

Quizzes (6 and **best 5** will be counted)	30%
Mid Term	30%
Final Exam	40%

NOTE: **ASSESSMENTS MIGHT CHANGE IF WE GO ONLINE**

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

Week/Weeks (Starting Date)		Reading Material from Book
(1) **7th March**	1) Discussion of Course Plan 2) Definitions and Classification of Differential Equations 3) Formation of Differential Equations	 Pages: 4-6 Pages: 14-18
(2) **14th March**	1) First Order Ordinary Differential Equation 2) Separable Equations **QUIZ-1** (from **First Week Course)** on **Friday** (**18th March)**	Page: 27 Pages: 36-38
(3) **21st March**	1) Homogeneous Equations 2) Exact Equations	Pages: 46-49 Pages: 28-35
(4) **28th March**	1) Inexact Equations and Integrating Factors 2) First Order Linear Equations **QUIZ-2** (from **2nd** and **3rd Weeks' Course)** on **Friday** (**1st April**)	Pages: 39-42 Pages: 43-44
(5) **4th April**	1) Bernoulli Equations 2) Clairaut's Equation	Page: 45 Pages: 58

(6) **11th April**	Second Order Linear Equations **QUIZ-3** (from **4th** and **5th Weeks' Course)** on **Monday (11th April)**	Pages: 139-148
(7) **19th April**	Linear Homogeneous Equations: the Wronskian	Pages: 153-157
(8) **25th April**	Non-Homogeneous Equations	Page: 159
(9) **9th May**	The Method of Undetermined Coefficients **MID-TERM (On Friday 13th May)** **Mid-Term Course: Topics covered** in **first 8 Weeks Lectures**	Pages: 160-167
(10) **16th May**	Method of Variations of Parameters	Pages: 168-170
(11) **23rd May**	Euler's Differential Equation **QUIZ-4** (from **9th** and **10th Weeks' Course)** on **Friday** (**27th May**)	Pages: 180-183
(12) **30th May**	Introducing the Laplace Transformation	Pages: 244-247
(13) **06th June**	Properties of Laplace Transformation **QUIZ-5** (from **11th, 12th Weeks' Course)** on **Friday** (**10th June**)	Pages: 248-250

(14) **13th June**	Inverse Laplace Transform and its Properties	Pages: 259-260
(15) **20th June**	Solution of Ordinary Differential Equations using Laplace Transform **QUIZ-6** (from **13th, 14th Weeks' Course)** on **Friday** (**24th June**)	Pages: 261-264
(16) **27th June**	**Final exams/assessments start. Date will be announced later.**	

One More Facility: "10 COURSE PACKS" have been made available in the Library, which students can issue for 5 days, which contains all the selected pages of your text book which are indicated in the 15 weeks schedule. **Course Pack is also available at book shop in RS. 80.**

Quizzes/Exams Distribution: Quizzes/Exams will be distributed in the class but if anyone is going to be absent then he/she should get quizzes from the class representative. Quizzes/Exams will be **discussed** within **first three days only** (after the quiz/exam).