# DEPARTMENT OF MATHEMATICS
# FACULTY OF ENGINERING AND TECHNOLOGY
# SRM UNIVERSITY

## MA0535– APPLIED MATHEMATICS FOR BIOTECHNOLOGISTS

SEMESTER I                                                        ACADEMIC YEAR: 2012-2013

## LECTURE SCHEME / PLAN

The objective is to equip the students of Engineering and Technology, the knowledge of Mathematics and its applications so as to enable them to apply them for solving real world problems.

The list of instructions (provided below) may be followed by a faculty relating to his/her own schedule includes warm-up period, controlled/free practice, and the respective feedback of the classes who handle. The lesson plan has been formulated based on high quality learning outcomes and the expected outcomes are as follows

Each subject must have a minimum of 50 hours, which in turn, 45 hours for lecture and rest of the hours for tutorials. The faculty has to pay more attention in insisting the students to have ≤ 95 % class attendance.

| UNIT I: DIFFERENTIAL EQUATION | | | |
|---|---|---|---|
| **Lect. No** | **Lesson schedule** | **Learning outcomes** | **Cumulativ e hours** |
| L 1.1 | To refresh and enhance the prerequisite mathematical knowledge for the course | • To motivate the students for the course. | 1 |
| L1.2 | Homogenous differential equation | | 2 |
| L.1.3 | Problems | • Homogeneous linear differential equations with constant co-efficient are used to solve optimization problems. | 3 |
| L.1.4 | Linear differential equation of Second order & higher order | | 4 |
| L.1.5 | Complimentary function and particular integral | • To obtain the Wave and Heat equations. | 5 |
| L.1.6 | Problems | | 6 |
| L.1.7 | Variable coefficient differential equations problems | | 7-8 |
| L.1.8 | Problems and review | | 9 |
| CYCLE TEST – I : | | DATE: 09.10.2012 | |
| UNIT II: LAPLACE TRANSFORMS | | | |
| L.2.1 | Introduction to Laplace Transforms | | 10 |

# Department Of Mathematics Faculty Of Enginering And

**Jicheng Xie**

**Department Of Mathematics Faculty Of Enginering And:**

*Fractional Differential Equations* Praveen Agarwal,Carlo Cattani,Shaher Momani,2024-04-29 Fractional Differential Equations Theoretical Aspects and Applications presents the latest mathematical and conceptual developments in the field of Fractional Calculus and explores the scope of applications in research science and computational modelling Fractional derivatives arise as a generalization of integer order derivatives and have a long history their origin can be found in the work of G W Leibniz and L Euler Shortly after being introduced the new theory turned out to be very attractive for many famous mathematicians and scientists including P S Laplace B Riemann J Liouville N H Abel and J B J Fourier due to the numerous possibilities it offered for applications Fractional Calculus the field of mathematics dealing with operators of differentiation and integration of arbitrary real or even complex order extends many of the modelling capabilities of conventional calculus and integer order differential equations and finds its application in various scientific areas such as physics mechanics engineering economics finance biology and chemistry among others However many aspects from the theoretical and practical point of view have still to be developed in relation with models based on fractional operators Efficient analytical and numerical methods have been developed but still need particular attention Fractional Differential Equations Theoretical Aspects and Applications delves into these methods and applied computational modelling techniques including analysis of equations involving fractional derivatives fractional derivatives and the wave equation analysis of FDE on groups direct and inverse problems functional inequalities and computational methods for FDEs in physics and engineering Other modelling techniques and applications explored by the authors include general fractional derivatives involving the special functions in analysis fractional derivatives with respect to another function in analysis new fractional operators in real world applications fractional order dynamical systems hidden attractors in complex systems nonlinear dynamics and chaos in engineering applications quantum chaos and self excited attractors Provides the most recent and up to date developments in the theory and scientific applications Fractional Differential Equations Includes transportable computer source codes for readers in MATLAB with code descriptions as it relates to the mathematical modelling and applications Provides readers with a comprehensive foundational reference for this key topic in computational modeling which is a mathematical underpinning for most areas of scientific and engineering research   Mathematical Reviews ,2002   **150 Years of Mathematics at Washington University in St. Louis** Gary R. Jensen,Steven George Krantz,2006 Articles in this book are based on talks given at the conference commemorating the 150th anniversary of the Washington University in St Louis The articles cover a wide range of important topics in mathematics and are written by former and present faculty or graduates of the Washington University Department of Mathematics The volume is prefaced by a brief history of the Washington University Department of Mathematics a roster of those who received the PhD degree from the department and a list of the Washington University Department of Mathematics faculty   Analytic Function Theory of One Complex Variable Yūsaku Komatsu,Kiyoshi

Niino,1989    Engineering Education ,1921    Probability, Statistics, and Stochastic Processes for Engineers and Scientists Aliakbar Montazer Haghighi,Indika Wickramasinghe,Emmanuel A. Appiah,2020-07-14 2020 Taylor Francis Award Winner for Outstanding New Textbook Featuring recent advances in the field this new textbook presents probability and statistics and their applications in stochastic processes This book presents key information for understanding the essential aspects of basic probability theory and concepts of reliability as an application The purpose of this book is to provide an option in this field that combines these areas in one book balances both theory and practical applications and also keeps the practitioners in mind Features Includes numerous examples using current technologies with applications in various fields of study Offers many practical applications of probability in queueing models all of which are related to the appropriate stochastic processes continuous time such as waiting time and fuzzy and discrete time like the classic Gambler s Ruin Problem Presents different current topics like probability distributions used in real world applications of statistics such as climate control and pollution Different types of computer software such as MATLAB Minitab MS Excel and R as options for illustration programing and calculation purposes and data analysis Covers reliability and its application in network queues
    Mathematica Japonicae ,2000    **Bulletin of the Society for the Promotion of Engineering Education** ,1921
    Scientiae Mathematicae Japonicae ,2001    *1987 National Science Foundation Authorization* United States. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research, and Technology,1986    **The Electrical Journal** ,1915    *Parliamentary Papers* Great Britain. Parliament. House of Commons,1914    **Collected Papers. Volume X** Florentin Smarandache,2022-06-01 This tenth volume of Collected Papers includes 86 papers in English and Spanish languages comprising 972 pages written between 2014 2022 by the author alone or in collaboration with the following 105 co authors alphabetically ordered from 26 countries Abu Su an Ali Hassan Ali Safaa Sadiq Anirudha Ghosh Assia Bakali Atiqe Ur Rahman Laura Bogdan Willem K M Brauers Erick Gonz lez Caballero Fausto Cavallaro Gavril Calefariu T Chalapathi Victor Christianto Mihaela Colhon Sergiu Boris Cononovici Mamoni Dhar Irfan Deli Rebeca Escobar Jara Alexandru Gal N Gandotra Sudipta Gayen Vassilis C Gerogiannis Noel Batista Hern ndez Hongnian Yu Hongbo Wang Mihaiela Iliescu F Nirmala Irudayam Sripati Jha Darjan Karaba evi T Katican Bakhtawar Ali Khan Hina Khan Volodymyr Krasnoholovets R Kiran Kumar Manoranjan Kumar Singh Ranjan Kumar M Lathamaheswari Yasar Mahmood Nivetha Martin Adrian M rgean Octavian Melinte Mingcong Deng Marcel Migdalovici Monika Moga Sana Moin Mohamed Abdel Basset Mohamed Elhoseny Rehab Mohamed Mohamed Talea Kalyan Mondal Muhammad Aslam Muhammad Aslam Malik Muhammad Ihsan Muhammad Naveed Jafar Muhammad Rayees Ahmad Muhammad Saeed Muhammad Saqlain Muhammad Shabir Mujahid Abbas Mumtaz Ali Radu I Munteanu Ghulam Murtaza Munazza Naz Tahsin Oner Gabrijela Popovi Surapati Pramanik R Priya S P Priyadharshini Midha Qayyum Quang Thinh Bui Shazia Rana Akbara Rezaei Jes s Estupi n Ricardo R dvan Sahin Saeeda Mirvakili Said Broumi A A Salama Flavius Aurelian S rbu Ganeshsree Selvachandran Javid Shabbir Shio

Gai Quek Son Hoang Le Florentin Smarandache Dragi a Stanujki S Sudha Taha Yasin Ozturk Zaigham Tahir The Houw Iong Ayse Topal Alptekin Uluta Maikel Yelandi Leyva V zquez Rizha Vitania Luige Vl d reanu Victor Vl d reanu tefan Vl du escu J Vimala Dan Valeriu Voinea Adem Yolcu Yongfei Feng Abd El Nasser H Zaied Edmundas Kazimieras Zavadskas <u>Canadian Almanac and Miscellaneous Directory</u> ,1920 *Proceedings of the American Society of Civil Engineers* American Society of Civil Engineers,1917 *The Electrical Engineer* ,1909 *The Journal of Education* ,1914 **Report** Commonwealth Shipping Committee,1911 *Colorado Engineers' Magazine* ,1917 *Neutrosophic Knowledge, Vol. 1, 2020* A. A. Salama, Florentin Smarandache, Ibrahim Yasser,2020-03-01 Neutrosophic Knowledge NK is an American academic journal published bimonthly online and on paper by The University of New Mexico that has been created for publications of advanced studies in neutrosophy neutrosophic set neutrosophic logic neutrosophic probability neutrosophic statistics neutrosophic algebraic structures etc and their applications in any field

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