Department of Mathematics
Keral Verma Subharti College of Science

Website www.subharti.org e-mail science@subharti.org/subharti science@gmail.com, Ph 0121-2439043 / 52 (Extn 2728.) Telefax 0121-2439067

A constituent college of

SWAMI VIVEKANAND SUBHARTI UNIVERSITY

(Established under U P Govt Act no 29 of 2008 and approved under section 2(f) of UGC Act 1956)

Ref: KVSCOS/Math/2017/VAC/005   01.09.2017

NOTICE

Session: 2017-18

Subject: Value Added courses regarding

It is hereby informed to all UG students that for enhancement of knowledge and skills, the department have introduced a value added courses OFICE AUTOMATION TOOLS and BIOMATHEMATICS.

Students are suggested to register themselves for participating in value added courses:

S. No.	Course	Course Code	Course duration
1	Office Automation Tools	VAC-Math-101	10.09.2017 to 15.09.2017
2	Biomathematics	VAC-Math-104	16.09.2017 to 20.09.2017

The course is of 30 hrs and a certificate will be issued after the completion of the course.
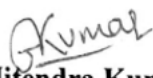
Registration can be made two days before the start of the course.

For more information and registration, contact HoD.

Copy to:
1. The Dean … for information
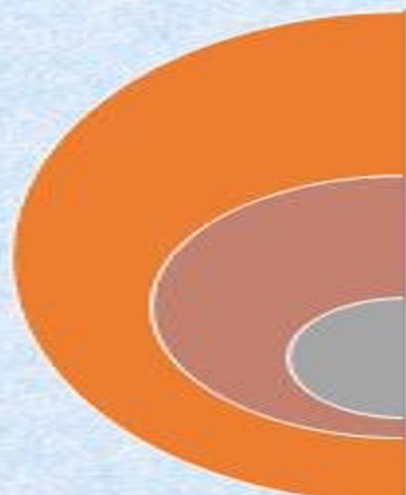2. Notice Board … for students information
3. Concern Course Coordinators

Registrar
Swami Vivekanand
Subharti University
MEERUT

[Dr. Jitendra Kumar]
Officiating HOD Mathematics

VALUE ADDED COURSE
BIOMATHEMATICS
VAC-Math-104

2017-2018

OBJECTIVE		• The focus of this course is on scientific study of normal functions in living systems. The emphasis is on exposure to nonlinear differential equations with examples such as heartbeat, chemical reactions and nerve impulse transmission. The basic concepts of the probability to understand molecular evolution and genetics have also been applied.
DURATION		• 16-20 SEPTMBER 2017
VANUE		• KERAL VERMA SUBHARTI COLLEGE OF SCIENCES

Course convener
Dr. Jitendra Kumar
Assistant Professor
Dept. of Mathematics
+91-8410340202
Jitte.dm@gmail.com

Cordinator
Dr. Vikas Tyagi
Associate Professor
Dept. of Mathematics
+91-9897103420
vt46460@gmail.com

VALUE ADDED COURSE
BIOMATHEMATICS

2017-2018

REGISTRATION FORM

Student's name.: ....

Enrollment No.: ....

Programme.: ....

Year/Semester.: ....

Contact No.: ....

Email Id (optional).: ....

Signature.: ....

Course Coordinator

Name of Value Added Course: **Biomathematics**
Course Code: **VAC-Math-104**
Time: **30hrs**

Course Objectives: The focus of the course is on scientific study of normal functions in living systems. The emphasis is on exposure to nonlinear differential equations with examples such as heartbeat, chemical reactions and nerve impulse transmission. The basic concepts of the probability to understand molecular evolution and genetics have also been applied.

Course Contents:
Unit 1: Modeling Biological Phenomenon
Population growth, Administration of drugs, differential equations, Heartbeat, Nerve impulse prey models. Cell division, Systems of linear ordinary transmission, Chemical reactions, Predator-

Unit 2: Mathematics of Heart Physiology and Nerve Impulse Transmission
Stability and oscillations: Epidemics, The phase plane and the Jacobian matrix, Local stability, Stability, Limit cycles, Forced oscillations; Mathematics of Heart Physiology: The local model, The Threshold effect, The phase plane analysis and the heartbeat model, A model of the cardiac pacemaker; Mathematics of Nerve Impulse Transmission: Excitability and repetitive firing, Travelling waves.

Unit 3: Bifurcation and Chaos
Bifurcation, Bifurcation of a limit cycle, Discrete bifurcation and period-doubling, Chaos, Stability of limit cycles, The Poincaré plane.

Unit 4: Modeling Molecular Evolution and Genetics
Modelling Molecular Evolution: Matrix models of base substitutions for DNA sequences, The Jukes-Cantor model, The Kimura models, Phylogenetic distances; Constructing Phylogenetic Trees: Phylogenetic trees, Unweighted pair-group method with arithmetic means (UPGMA), Neighbor joining method; Genetics: Mendelian genetics, Probability distributions in genetics.

Course Learning outcomes: Apropos conclusion of the course will empower the student to:
1. Learn the development, analysis and interpretation of bio mathematical models.
2. Reinforce the skills in mathematical modeling.
3. Appreciate the theory of bifurcation and chaos.
4. Learn to apply the basic concepts of probability to molecular evolution and genetics.

References:
1. Allman, Elizabeth S., & Rhodes, John A. (2004). *Mathematical Models in Biology: An Introduction*. Cambridge University Press.
2. Jones, D. S., Plank, M. J., & Sleeman, B. D. (2009). *Differential Equations and Mathematical Biology* (2nd ed.). CRC Press, Taylor & Francis Group, LLC.

Additional Readings:
1. Murray, J. D. (2002). *An Introduction to Mathematical Biology* (3rd ed.). Springer.
2. Myint-U, Tyn (1977). *Ordinary Differential Equation*. Elsevier North-Holland, Inc.
3. Simmons, George F., & Krantz, Steven G. (2015). *Differential Equations*. McC Hill Education. Indian Reprint.
4. Strogatz, Steven H. (2009). *Nonlinear Dynamics and Chaos* (2nd ed.). Perseus Book Publishing. LLC. Sarat Publication, Kolkata, India.

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<u>Report on Value Added Course</u>

A one week value added course on BIOMATHEMATICS was conducted in the department for UG students. The course starts on 16-09-2017 and 48 students registered themselves in the course. The sessions were handled by course co-ordinators Dr. Jitendra Kumar & Dr. Vikas Kumar. The course was completed on 20-09-2017 and all the 48 students registered successfully completed the course. Students felt that the course was very much helpful and they got the basic knowledge on biomathematics.

HOD
Department of Mathematics

Registrar
Swami Vivekanand
Subharti University
MEERUT

List of Students

Sl. no	Name of students		Sl. no	Name of students
1.	Gaurav Baisala		25.	Mahima Choudhary
2.	Ajay		26.	Neelam Rani
3.	Kajal Chauhan		27.	Neetu Kuniyal
4.	Km Kajol Kumari		28.	Rajat Choudhary
5.	Nikita Sharma		29.	Shalu Chhabra
6.	Palak Jindal		30.	Shivani Singh
7.	Prashant Singh		31.	Shujaat Ali
8.	Ritik Malik		32.	Vatan Singh Pal
9.	RupalCaudhary		33.	Aakash Choudhary
10.	Shivam Chaudhary		34.	Amit Pal
11.	Tanya		35.	Ayush Malik
12.	Vivek Gaur		36.	Bhavishya Kumar Singh
13.	Himanshu		37.	Kartik Puniya
14.	Akshay Jain		38.	Lalramnghaka
15.	Anuj Pal		39.	Mintoo Singh
16.	Taj Mohammad		40.	Mohd Anas
17.	Ashish Choudhary		41.	Mohd Nasir
18.	Deepak Choudhary		42.	Nitin Yadav
19.	Kuldeep Singh		43.	Parul Saini
20.	Lovey		44.	Riya Sharma
21.	Prince Malik		45.	Saurabh Kumar
22.	Shivam Bhardwaj		46.	Shivani
23.	Shubham Singh		47.	Shruti Parashar
24.	Vijay Kumar		48.	Sourabh Sharma

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