



Estd. 1962  
NAAC 'A' Grade

SHIVAJI UNIVERSITY, KOLHAPUR-416 004. MAHARASHTRA

PHONE : EPABX-2609000 website- [www.unishivaji.ac.in](http://www.unishivaji.ac.in)

FAX 0091-0231-2691533 & 0091-0231-2692333 – BOS - 2609094

शिवाजी विद्यापीठ, कोल्हापूर – 416004.

दुरध्वनी (ईपीएबीएक्स) २६०९००० (अभ्यास मंडळे विभाग- २६०९०९४)

फॅक्स : ००९१-०२३१-२६९१५३३ व २६९२३३३. e-mail: bos@unishivaji.ac.in

SU/BOS/Science/ 7559

Date: 27/07/2018

To,

The Head/Co-ordinator/Director  
All Concerned Department (Science)  
Shivaji University, Kolhapur.

**Subject:** Regarding syllabi of Value Added programme D.S.T. Purse Phase-2 under the Faculty of Science and Technology.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the syllabi, Value Added programme D.S.T. Purse Phase-2 under the Faculty of Science and Technology.

Sr.No.	Name of the Department	Name of the Course	Total hours
1	Biochemistry	Techniques in Biochemistry	30
		Advanced Course in Biostatistics, Bioinformatics and Research Methodology	30
2	Biotechnology	Introduction and What does the law say? Unit-I	15
		Implementing human rights in biotechnology Unit-II	15
3	Chemistry	Hands on training of Instrumental methods for Chemical Analysis	30
4	Geography	Six days value added course on Introduction to Q GIS software	30
5	Mathematics	Computational Mathematics with MATLLAB and SCILAB	50
6	Statistics	Introduction to Python Programming	30
7	Nano Science & Technology	Python for Data Science	30
		Certificate course in Scientific and Technical Writing Unit-I	15
8	Computer Science	Certificate course in Scientific and Technical Writing Unit-II	15
		Advances in Data Science/Hadoop/Machine Learning	30
9	Electronics	Robotics: An Hands on Approach	30
10	Environmental Science	Determination of Physico-Chemical and Microbiological Parameters in Drinking water	30
11	Zoology	Culture and Multiplication techniques of ornamental fishes	30
12	Microbiology	Development and application of Biofertilizers	30
13	Botany	Commercialization of important Plants through tissue culture	30
14	Physics	Instrumentation in Physical Science	30
15	A.G.P.M.	Certificate Course in Integrated Pest Management	30

This syllabi shall be implemented from July 2018 onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website [www.unishivaji.ac.in](http://www.unishivaji.ac.in) (Online Syllabus)

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully,

  
Dy Registrar

Copy to:

1	The Dean, Faculty of Science and Technology	7	P.G.Seminar Section
2	Director, Board of Examinations and Evaluation	8	Computer Centre
3	The Chairman, Respective Board of Studies	9	Affiliation Section (U.G.)
4	B.Sc. Exam	10	Affiliation Section (P.G.)
5	Eligibility Section	11	P.G.Admission Section
6	Appointment Section		

Name of Department: Department of Biochemistry

Date: 19/05/2018

	Title of Value Added Course	Curriculum of Course	Total Hours	List of Experts	Approximate expense
1.	Techniques in Biochemistry	Hands on training on high ended equipment in the department such as HPLC, HPTLC, GC, Electrophoresis, Spectrofluorimeter, Animal Cell culture, PCR & DNA Sequencer, Chromatography.	30	1. Mr. Laxman Bavkar 2. Mr. Shivtej Biradar 3. Mr. Sheetalnath Rooge 4. Mr. Rahul Patil 5. Ms. Megha Nalawade 6. Mr. Mohsin Tamboli 7. Mr. Herwade 8. Mr. S. S. Kale	Rs. 20,000/=
2.	Advanced Course in Biostatistics, Bioinformatics and Research Methodology	Statistical tools needed in biological research up to use of power statistics, Use of Bioinformatics for docking studies, drug interactions, ligand interactions and advanced research techniques	30	To be finalized. Faculty to be invited from outside.	Rs. 25,000/=

The Course No. 1 is towards giving a hands on training to M.Sc. students that will improve their prospects of employability as well as benefit them in their curriculum especially towards handling their Research Projects. The course will be run by research students each having an expertise in use of one equipment regularly. This course will also benefit research students and keep the high ended equipment in use. Course No. 2 is going one step ahead in familiarizing students with advanced methods in biostatistics as well as Bioinformatics.

Prof. & Head, Department of Biochemistry

Name of Department: Department of Biochemistry

Date: 19/05/2018

No.	Name of proposed Equipment	Specification	Type of purchase	Approximate Cost
1.	ELISA Reader		Quotation	2.5 lakhs
2.	Balance		Quotation	1.0 lakh
3.	Water bath		Quotation	70, 000/=
4.	Plant tissue culture racks (2)		Quotation / USIC	50,000/=
5.	Minor equipment such as Vortex, Spin win, pH meter, etc.		Quotation	50,000/=

(with due bargain the amount can be fitted in Rs. 5,00,000/=)

Exact specification will be submitted in a day or two

Prof. & Head, Department of Biochemistry

Name of Department: Biotechnology

Date: 21/05/2018

No.	Title of Value added course	Curriculum of course	Total Hours	List of Experts	Approx. Exp.
1	<b>Human Rights</b> <b>Unit 1:</b> Introduction and what does the law say?	<ol style="list-style-type: none"><li>1. Pre-course awareness.</li><li>2. UNITED awareness and pledge.</li><li>3. The story of human rights.</li><li>4. Human rights introduction.</li><li>5. Human rights articles</li></ol>	15	Dr. Manisha Rajebhosale	Rs. 7500/-
2	<b>Human Rights</b> <b>Unit 2:</b> Implementing human rights.	<ol style="list-style-type: none"><li>1. Learn things that anyone can do for human rights.</li><li>2. Examples of human rights violations.</li><li>3. Human rights creative projects.</li><li>4. Spreading the word.</li></ol>	15	Dr. Manisha Rajebhosale	Rs. 7500/-

  
Co-ordinator

Name of the Department:- Department of Chemistry


Date:- 21<sup>st</sup> May 2018

No	Title of Value Added Course	Curriculum of the course	Total Hours	List of Experts	Approximate Expenditure
1	HANDS ON TRAINING OF INSTRUMENTAL METHODS FOR CHEMICAL ANALYSIS	<p><b>1. Use of computational tools in chemistry (6h)</b></p> <p>Introduction to Microsoft excel and other equivalent tools, curve fitting, data analysis and error estimations, 3D data visualization, surface plotting, etc. Computational freewares (Avogadro, Gabedit, MOPAC, VMD, GROMACS, etc.) for estimation of molecular properties such as optimization of molecular geometries, conformational analysis, calculation of vibrational spectra, thermochemical calculation using semiempirical tools.</p> <p><b>2. Dynamic light Scattering (DLS) technique (2h)</b></p> <p>Principle, Instrumentation, Demonstration during data collection, Particle size distribution analysis for nano materials.</p> <p><b>3. Diffuse reflectance and Mossbauer</b></p>	30	<p><b>1. Dr. Mrs. Veda Ramswamy</b> Retired Scientist Catalysis Division National Chemical Laboratory Pune 411008</p> <p><b>2. Prof. K. M. Garadkar</b> Department of Chemistry Shivaji University, Kolhapur</p> <p><b>3. Prof. D.M. Pore</b> Department of Chemistry Shivaji University, Kolhapur</p> <p><b>4. Prof. S.D. Delkar</b> Department of Chemistry Shivaji University, Kolhapur</p> <p><b>5. Dr. D.H. Dagade</b> Assistant Professor Department of Chemistry Shivaji University,</p>	Rs. 45,000/-

	<p><b>Spectroscopy (4h)</b></p> <p>Principle of Diffuse reflectance UV-visible spectroscopy, Instrumentation, sample preparation, data collection and interpretation, calculations of direct band gap energies of CdS, ZnO and TiO<sub>2</sub>, Mossbauer (spectral interpretation),</p>	<p>Kolhapur</p> <p><b>6. Dr. B. R. Sathe</b> Assistant Professor Department of Chemistry Dr. Babasaheb Ambedkar Marathwada Univeristy Aurangabad</p>	
	<p><b>4. Role of IR and UV-Visible spectroscopy in analysis of organic molecules (4h)</b></p> <p>Principle of IR and UV-Visible spectroscopies, instrumentation, demonstration of IR and Uv-Visible data collection, case studies using IR and UV-Visible spectroscopy</p>	<p><b>7. Dr. S.A. Sankpal</b> Assistant Professor Department of Chemistry Shivaji University, Kolhapur</p>	
	<p><b>5. Thermogravimetric Analysis (2h)</b></p> <p>Theory of TGA and data interpretation with case studies</p>	<p><b>8. Dr. D.S. Bhang</b> Assistant Professor Department of Chemistry Shivaji University, Kolhapur</p>	
	<p><b>6. Nuclear Magnetic Resonance (NMR) spectroscopy (4h)</b></p> <p>Principle and instrumentation, NMR demonstration for data collection,</p>	<p><b>9. Mr. R.K. Jha</b> Senior Technical Officer Catalysis Division National Chemical Laboratory Pune 411008</p>	

		<p>interpretation of <math>H^1</math> and <math>C^{13}</math> NMR spectra of various organic compounds</p>		<p><b>7. Powder X-ray diffraction for Materials Analysis/Characterization (6h)</b></p> <p>An overview of X-ray production, Bragg's law and Theory of X-ray diffraction, role of XRD technique in Materials Science. Demonstrations of freewares used in XRD data analysis and Structure drawing. Analysis of powder XRD patterns for qualitative phase analysis. Quantitative phase analysis (Relative intensity ratio method), indexing of XRD pattern of simple cubic system, solution of simple structures such as Au, Pt, NaCl, CsBr etc.,.</p>	
				<p><b>8. Surface area, Pore size distribution &amp; pore volume analysis of porous materials (2h)</b></p> <p>Introduction to BET equation, demonstration and data collection, interpretation of the data for surface area determination, (BJH) pore size</p>	

		distribution calculations	and	pore	volume			
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Professor & Head  
Department of Chemistry  
Shivaji University, Kolhapur-416 004

Details of Course : -

VALUE ADDED COURSE-2018  
DEPARTMENT OF GEOGRAPHY  
SHIVAJI UNIVERSITY, KOLHAPUR

**Course Name- Six days Value Added Course on “Introduction to ‘Q’ GIS Software”**

**Introduction-**

A geographic information system (GIS) is a framework for gathering, managing, and analyzing data. Rooted in the science of geography, GIS integrates many types of data. It analyzes spatial location and organizes layers of information into visualizations using maps and 3D scenes. With this unique capability, GIS reveals deeper insights into data, such as patterns, relationships, and situations helping users make smarter decisions.

The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS is more than just software. People and methods are combined with geospatial software and tools, to enable spatial analysis, manage large datasets, and display information in a map/graphical form.

Therefore, we are going to arrange value added courses for M.A/M.Sc. students to get the knowledge of advance technology in Geography to survive in the open market.

**Objectives-**

- 1) To introduce students to the concepts and the techniques of handling geographical data through a particular form of information system - GIS
- 2) To provide training of QGIS Software for Geospatial analysis and introduce students to the skills and techniques to input, manage, analyse and display spatial information.



**Number of Days and total hours :**

Days- 06

Total Lectures- 30

Time – 11 am to 6 pm

Date- 16<sup>th</sup> July 2018 to 21<sup>st</sup> July 2018

**Course Coordinator :** Dr. Jagdish B. Sapkale

**Organising Secretary :** Dr. M.B. Potdar

**List of Experts :** Teaching faculties and Guest faculties -

**Teaching Faculty-**

Prof. S. S. Panhalkar, Prof. S. D. Shinde, Dr. S.K. Powar, Dr. J. B. Sapkale, Dr. D. H. Pawar, Dr. D. S. Shinde, Dr. P. T. Patil, Dr. S. Dandpath, Dr. M. B. Potdar, Mrs. V. A. Chaugule, Mr. A. S. Patil.

**Guest Faculty-** Dr. P. Saymote, Dr. Sagar. P. Mali

**Course Schedule : 16<sup>th</sup> July 2018 to 21<sup>st</sup> July 2018**

Sr. No. (Hours)	Content	Theory/ Practical
1	Introduction to Remote Sensing, Types & Resolution	Theory
2	Introduction to GIS&Map Projection & Transformation	Theory
3	Introduction to QGIS	Practical
4	Data import &Getting familiar with QGIS interface	Practical
5	Projection &Reprojection	Practical
6	Raster & Vector data model	Theory
7	Raster data analysis	Theory
8	Georeferencing of Toposheet	Practical
9	Image Registration-1	Practical
10	Image Registration-2	Practical

11	Concept of Digitization, Digitization errors & Topology	Theory
12	Point, line & polygon; Concept of arc, node & vertices	Theory
13	Digitization- Point, Line & Polygon	Practical
14	Digitization-Toposheet-1	Practical
15	Digitization-Toposheet-2	Practical
16	Database: Spatial Data, Non-Spatial data	Theory
17	Database Management System (DBMS) & Relational data model	Theory
18	Data Exploration using QGIS	Practical
19	Working with tables-1	Practical
20	Working with tables-2	Practical
21	Application of RS & GIS in Urban & Regional planning	Theory
22	Application of RS & GIS in Water Resource Management	Theory
23	Spatial Querying-1	Practical
24	Spatial Querying-2	Practical
25	Attribute Querying	Practical
26	Map Preparation-1	Practical
27	Map Preparation-2	Practical
28	Project	Practical
29	Project	Practical
30	Project	Practical

**Approximate Expenditure : 45,000/-**

  
 (Dr. J. B. Sapkale)


**Course Coordinator**

  
 Head,  
 Department of Geography,  
 Shivaji University, Kolhapur

Name of the Department : Mathematics

Date : 21/5/2018

No.	Title of Value Added Course	Curriculum of Course	Total Hours	List of Experts	Approximate Expenditure
1	Computational Mathematics with MATLAB and SCLAB	Enclosed Separately.	50 hours	Dr. S. B. Chavan, Kolhapur Dr. R. S. Kalaskar, Pune Dr. H. P. Salunkhe, Kolhapur Dr. Sachin Wani, Mumbai Dr. Ashwini Kulkarni, Kolhapur	Rs. 30,000 (Rs. 15,000 for Honorarium and Rs. 15,000 for TA/DA)

  
**Professor & Head**  
**Department of Mathematics,**  
**Shivaji University,**  
**Kolhapur-416 004.**

# Computational Mathematics with MATLAB and SCILAB

Teaching Scheme : L+P+T : hrs/week

Credits: 2

## Course Outcome:-

Upon successful completion of this course, the student will be able to:

1. understand the main features of the MATLAB and SCILAB
2. work with functions in MATLAB
3. compute derivatives, limits and Integrals in MATLAB and SCILAB.
4. compute determinants, eigen values, solution of linear systems, solution of polynomial equations of one variable
5. To solve complicated numerical problems by writing MATLAB and SCILAB programs
6. find approximate solution to a real-world problem stated in complex mathematical models.

## Prerequisites-

A basic knowledge in matrix operations, differentiation, integration, curve fitting.

## Course Contents-

### Chapter-1 An Overview of MATLAB & SCILAB

10

- 1.1 Introduction of MATLAB & SCILAB
- 1.2 Menus and the Toolbar
- 1.3 Arrays, Files, and Plots
- 1.4 Script Files and the Editor/Debugger
- 1.5 The MATLAB & SCILAB Help System
- 1.6 Problem-Solving Methodologies
- 1.7 Matrix Operations
- 1.8 Interactive Plotting in MATLAB & SCILAB

## Chapter-2 Mathematical Model Building and Regression

- 2.1 Statistics and Histograms
- 2.2 Interpolation
- 2.3 Matrix Methods for Linear Equations
- 2.4 Numerical Differentiation
- 2.5 Numerical Integration
- 2.6 First-Order Differential Equations
- 2.7 Higher-Order Differential Equations
- 2.8 Simulation

10

### List of Practicals:

1. Introduction of Matlab and Scilab
2. Installation of Matlab and Scilab
3. Introduction to Matrices in Matlab/Scilab
4. Solving system of equations in Matlab/Scilab
5. Finding the eigen values and eigen vectors using Matlab/Scilab
6. Finding the Maxima and Minima of a Curve using Matlab/Scilab
7. Polynomial Curve Fitting using Matlab/Scilab
8. Least Squares Regression using Matlab/Scilab
9. Solving Differential Equations using Matlab/Scilab
10. Numerical solutions of differential equations of first order and first degree using Matlab/Scilab
11. Curve Tracing in Mathlab/Scilab
12. Finding Indefinite Integral using Matlab/Scilab
13. Finding Definite Integral using Matlab/Scilab
14. Solving Basic Algebraic Equations in Matlab/Scilab

### References-

1. Lyche, Tom, Merrien, Jean-Louis, Exercises in Computational Mathematics with MATLAB, Springer, 2014
2. Dingyü Xue, Yangquan Chen, Solving Applied Mathematical Problems With MATLAB, CRC Press
3. William J. Palm III, Introduction to MATLAB for Engineers, Published by McGraw-Hill
4. Claude Gomez, Engineering and Scientific Computing with Scilab, Springer Science & Business Media, 01-Jul-1999
5. Vinu V. Das, Programming in Scilab 4.1, 2009 ISBN: 978-8122424713
6. Scilab Textbook Companion for Higher Engineering Mathematics by B. S. Grewal
7. Dr. M. Affouf, Scilab by example, 2012, ISBN: 978-1479203444

Name of the Department: Department of Statistics

Date: 21/05/2018

Sr. No.	Title of Value Added Course	Curriculum of Course	Total Hours	List of Experts	Approximate expenditure
1	Introduction to Python Programming	<p><b>1. Introduction and Data types</b> Introduction, Installation and Working with Python, Understanding Python variables, Python basic Operators, Understanding python blocks, Input and Output- print() statement, Numeric data types: int, float, complex, string data type and string operations, Defining list and list slicing, Sequences of Data, Dictionaries Groupings of Data Indexed by Name, Special String Substitution Using Dictionaries, Arrays, Working with Sets</p> <p><b>2. Control structures, Functions and File operations</b> Control structures: Conditional blocks using if, else and elif for loop in python, Use of while loops in python, Loop manipulation using pass, continue, break, Python Functions, Modules and Packages: Organizing python codes using functions, Importing own module as well as external modules, Understanding Packages, Powerful Lambda function in python, Programming using functions, modules and external packages. File Operation: Reading config files in python, Writing log files in python, Understanding read functions, read(), readline() and readlines(), Understanding write functions, write() and writelines(), Manipulating file pointer using seek, Programming using file operations</p> <p><i>Hands on sessions will be conducted as and when required.</i> (15)</p> <p><b>References:</b> 1. Wes McKinney (2012). Python for Data Analysis. O'REILLY Publications.</p>	30	<p>1. Mr. S. D. Pawar, Dept. of Statistics, Shivaji University, Kolhapur</p> <p>2. Mr. S. V. Rajguru, Dept. of Statistics, Shivaji University, Kolhapur</p> <p>3. Dr. Santosh Sutar, YCSRD, Shivaji University, Kolhapur</p> <p>4. Mr. Parashuram Vadar, Dept. of Computer Science, Shivaji University, Kolhapur</p> <p>5. Mr. Kundlik Shende, Research Scholar, Dept. of Statistics, Shivaji University, Kolhapur</p> <p>6. Mr. Shivaji Disale, Chief Manager Credit and Risk / Marketing Analytics, Head of Advanced analytics Lab, Mumbai</p> <p>7. Mr. Suresh Parit, Deputy Manager Credit and Risk / Marketing Analytics, Head of Advanced analytics Lab, Mumbai</p> <p>8. Mr. Akshay Gujar, Deputy Manager Credit and Risk / Marketing Analytics, Head of Advanced analytics Lab, Mumbai</p>	Rs. 22,500/-

	<p>2. Dr. R. Nageswara Rao (2017). Core Python Programming, Wiley Publication.</p> <p>3. Lutz, M. (2013). Learning Python: Powerful Object-Oriented Programming. O'Reilly Media, Inc.</p> <p><b>Eligibility:</b> PG second year students from Statistics, Applied Statistics and Informatics, Mathematics, Physics, Electronics and Computer Science.</p> <p><b>Examination:</b> Students will be evaluated through theory and practical exam, each carrying 20 marks. There will be combine passing, i.e. for 16 marks out of 40.</p> <p>This course carries 2 credits.</p>		<p>Mumbai</p> <p>9. Mr. Shrikrishna Nevase Data Scientist, KPIT Technologies Limited, Pune</p> <p>10. Mr. Pritam Mahadik Data Scientist, KPIT Technologies Limited, Pune</p>	
2	<p><b>Python for Data Science</b></p> <p><b>1. Manipulating Data</b> Numpy : Introduction , Numpy Array , Array Indexing , Numpy Operations. Pandas : Introduction , Series, DataFrame , Indexing and Slicing of DataFrame, handling missing Data , GroupBy , Merge Join and concatenate Data visualization using Matplotlib: Simple line plot, simple scatter plot, visualizing error, density and contour plot, histogram, binning and density, multiple subplot. (15)</p> <p><b>2. Machine Learning</b> Introduction to scikit-learn, hyper parameters and model validations, feature engineering, Naïve Bayes classification, Regression, Support Vector machine, Decision Tree and Random Forest, Principal component Analysis, K-means Clustering. (15)</p> <p><i>Hands on sessions will be conducted as and when required.</i></p> <p><b>Reference:</b></p> <ol style="list-style-type: none"> <li>1. Jake Vanderplas (2017), Python Data Science Handbook, O'REILLY Publications, 2<sup>nd</sup> edition.</li> <li>2. Mueller, J. P., &amp; Massaron, L. (2015). Python for data science for dummies. John Wiley &amp; Sons.</li> </ol>	30	<ol style="list-style-type: none"> <li>1. Dr. D. N. Kashid, Dept. of Statistics, Shivaji University, Kolhapur</li> <li>2. Dr. H. V. Kulkarni, Dept. of Statistics, Shivaji University, Kolhapur</li> <li>3. Dr. S. B. Mahadik, Dept. of Statistics, Shivaji University, Kolhapur</li> <li>4. Dr. D. M. Sakate, Dept. of Statistics, Shivaji University, Kolhapur</li> <li>5. Mr. S. D. Pawar, Dept. of Statistics, Shivaji University, Kolhapur</li> <li>6. Mr. S. V. Raiguru, Dept. of Statistics, Shivaji University, Kolhapur</li> <li>7. Mr. Shivaji Disale, Chief Manager Credit and Risk / Marketing Analytics, Head of Advanced analytics Lab, Mumbai</li> <li>8. Mr. Suresh Parit, Deputy</li> </ol>	Rs. 22,500/-

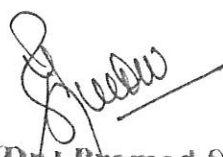
		<p><b>Eligibility:</b> PG second year students from Statistics, Applied Statistics and Informatics and Computer Science who have completed Introduction to Python Programming course conducted by Department of Statistics, Shivaji University, Kolhapur.</p> <p><b>Examination:</b> Students will be evaluated through theory and practical exam, each carrying 20 marks. There will be combine passing, i.e. for 16 marks out of 40.</p> <p>This course carries 2 credits.</p>	
	<p>Manager Credit and Risk / Marketing Analytics, Head of Advanced analytics Lab. Mumbai</p> <p>9. Mr. Akshay Gujar, Deputy Manager Credit and Risk / Marketing Analytics, Head of Advanced analytics Lab. Mumbai</p> <p>10. Mr. Shrikrishna Nevase Data Scientist, KPIT Technologies Limited, Pune</p> <p>11. Mr. Pritam Mahadik Data Scientist, KPIT Technologies Limited, Pune</p>		



**School of Nanoscience and Biotechnology,  
Shivaji University, Kolhapur**

Syllabus for Certificate course in “Scientific and Technical Writing”


Unit	Topics	No of Contact Hours
I	Why do we do research?; Why to communicate our research finding; Types of different scientific communication and Scientific writing; Technical writing, Introduction to Technical Writing, Basic Principles in Technical Writing: Writing Technical Documents, Elements of technical documents, Informal and formal technical reports/documents, Writing technical manuals and instruction; Writing scientific reports, Types of scientific reports, Lab report, lab journals, protocols, Introduction to journal publishing/Papers; Types of journal papers; Writing research paper; Writing review article; Synopsis writing; Thesis writing (Project, Ph.D)	15
II	Introduction of IPR, Introduction to patents and its writing; the curriculum vitae, Parts of a resume/biodata, letters of employment, resume format and distribution, cover letter writing, Scientific literature databases, Introduction to Scopus.com; web of science, Wiley online library, Springerlink; pubmed, ACS and others; Proposal writing – how to get started, Procedure for obtaining project funds, Project proposal writing, Introduction to sources for obtaining project funds. Publishing and peer review: the good, the bad, the ugly, Ethics in scientific writing and publishing.	15

  
**Prof. (Dr.) Pramod S. Patil**  
Co-ordinator,  
School of Nanoscience & Technology  
Shivaji University, Kolhapur-416 004  
Maharashtra India

Name of the Department: Computer Science

Date:- 24/05/2018

Sr. No.	Title of Value Added Course	Curriculum of Course	Total Hours	List of Experts	Approximate Exp.
1.	Advances in Data Science /Hadoop/ Machine Learning	1. Machine Learning 2. Deep Learning 3. Hadoop	30	To be identified	45,000/-
2.					

  
Prof. (Dr.) R. K. Kannai  
Co-ordinator,  
Department of Computer Science,  
Sri Veil University,  
Kanchipuram

Name of the Department: Electronics

Date:- 24/05/2018

Sr. No.	Title of Value Added Course	Curriculum of Course	Total Hours	List of Experts	Approximate Exp.
1.	Robotics: An Hands on Approach	1. Simulation Tools 2. Sensor Interfacing 3. Actuator Interfacing 4. Motor Interfacing techniques 5. Case Studies: Line Follower Pick and Place Arm movement	30	To be identified	45,000/-
2.					

Head,  
Department of Electronics

## Long term certificate course

On

### Determination of Physico-Chemical and Microbiological Parameters in Drinking water (Total lectures 30)

#### Objective:

To enable students to acquire knowledge and estimate the different parameters in drinking water to determine whether water is hygienically safe and fit for consumption

#### Syllabus

#### Unit 1 : Introduction

(6 lectures )

Drinking Water Sources and Water Supply Systems ,National drinking-water policy and standards. Water contamination and Health risk. Waterborne diseases. Global Drinking water scenario. Indian Drinking water scenario.

#### Unit 2: Sampling and Laboratory evaluation

(6 lectures )

WHO Guidelines for drinking-water quality, Water sampling,  
Physical parameters : Colour, Odour, Taste, Turbidity, Solids,  
Chemical Parameters : pH, Electrical Conductivity , residual chlorine, Total  
Hardness, Calcium, Magnesium, Chlorides , Nitrates  
Microbiological parameters, significance of identification of coliforms,  
Multiple tube fermentation technique, Field Testing Kits

#### Unit 3: Drinking water Treatment:

(6 lectures )

Principle and working of Water Treatment plants ,Chlorination , Ozonation ,  
Other disinfection processes , Filtration , Aeration , Chemical coagulation  
, Activated carbon adsorption , Ion exchange , Membrane processes , Other  
treatment , Disinfection by-products , Treatment for corrosion control ,  
Household treatment,

#### Unit 4 : Rural Drinking water management:

(6 lectures )

Role of Gram Panchayats in provisioning of drinking water, Village Water Safety  
Assessment, National Rural Drinking Water Program (NRDWP), Management of  
Drinking Water during Disasters

#### Unit 5: Visit and laboratory demonstrations:

(6 lectures )

Value Added Course in Zoology Dept., SUK under  
DET - PURS PROGRAM.

Short term training Program on  
Ornamental Fish Breeding, Rearing and its Management

23/07/2018 to 28/07/2018

:Venue:

Department of Zoology, Shivaji University, Kolhapur

Syllabus		
Sr. no	Topic	Syllabus (Key words)
1	Introduction, Identification and Biology of Ornamental fishes	Present status and future prospectus of ornamental fish industry Identification of ornamental fishes by morphological characters Feeding and reproduction of ornamental fishes.
2	Live food in Aquarium	Importance of live food for ornamental fish rearing Types of live food Methods of live food production
3	Water Quality /	Water Quality required in ornamental fish rearing Analysis of water quality parameters: Temperature, pH, dissolved oxygen and Nitrite nitrogen and nitrate nitrogen etc Acceptable limits of water quality parameters for breeding and rearing
4	Artificial feed preparation	Importance of Artificial feed in ornamental fish rearing Types of artificial feed and their formulations Methods used for preparation of artificial feed
5	Fabrication of tank	Types of all glass tank Materials and method used for fabrication of glass tank Decoration of glass tank Calculation of water and glass requirement
6	Aquatic plants	Importance of Aquatic plants in ornamental fish rearing. Types of Aquatic plants Aquatic plant production
7	Breeding of ornamental fishes/	Breeding and rearing of egg laying fishes Breeding and rearing of live bearer fishes
8	Packaging and transportation	Importance of Packing and transportation in ornamental fish breeding and rearing. Types of packaging materials Methods of ornamental fish transportation
9	Hatchery Management	Hatchery Management practices Best management practices (BMP) Important points considered for establishment of Hatchery Project formulation for establishment of ornamental fish hatchery
10	Ornamental Fish Disease	Diseases in ornamental fishes Types of disesses Treatments used to control of fish disease Preventive measures.

The above syllabus was discussed in BOS meeting held on 16.7.2018 in Shivaji University and it is approved. It needs to be sent to Deay of Science for further needful.

Suryam  
(Dr. S. M. Patil)

V. Y. Deshpande

M. V. Sartha  
(Dr. V. S. Manne)

S. S. Dalk  
Professor & Head  
Department of Aquaculture  
College of Fisheries, Shirgaon, Ramnagar

Dr. R. S. Dabhal

Dr. R. D. Bodare

Dr. T. S. Bhosale

Dr. S. S. Patil

Dr. Khobare

Dr. Bhingardeve

Department of Microbiology

Shivaji University, Kolhapur

A syllabus for Value Added Course

- **Course Code:**
- **Title of the Course:** Development and Application of Biofertilizers
- **Department at which course will be conducted:** Microbiology
- **Duration:** 30 lectures
- **Eligibility:** Students who have completed M.Sc. Part I/II in the subjects of Microbiology, Pharmaceutical Microbiology, Biotechnology, Biochemistry, Environmental Biotechnology, Botany, Zoology, Environmental Science, Agrochemicals and Pest Management.
- **Course content:** **30 Lectures**

**Soil Environment:**

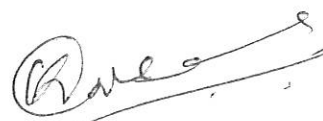
Physicochemical and biological properties of soil, Soil microorganisms, biogeochemical cycles C, N, S and P, Microbial products influencing plant growth, plant growth promoting rhizobacteria, recycling of agricultural waste.

**Biofertilizers:**

Socioeconomical impact of biofertilizer on Indian agriculture, types of Biofertilizers- Azotobacter, Rhizobium, Azolla, Phosphate solubilizing bacteria, vascular Arbuscular Mycorrhiza (VAM), General methods of production and applications of biofertilizers, Quality control of Bio fertilizers as per Fertilizer Control Order (FCO).

**Text books/reference books:**

1. Soil Microbiology by Alexander Martin
2. Soil and Soil Microbiology by Subbarao
3. Introduction to Microbiology by Prescott, Harley and Keim



Department of Botany,  
Shivaji University  
Value Added Course

No.	Title of Value added Course	Curriculum of Course	Total Hours	List of Experts	Approximate Exp. (Rs.)
	<p style="text-align: center;"><b>“Commercialization of important plants through tissue culture”</b></p>	<p style="text-align: center;">Duration : 6 Days Lectures : 12 hours Practical / demonstration session : 18 hours Field / Nursery / Laboratory visit : 1 day</p> <p><b>UNIT 1 :</b> Objective and goals of Plant tissue culture; Laboratory space and design, Operation and management . Culture conditions, medium &amp; its constituents , Green house : types and management, Hardening techniques,</p> <p><b>UNIT 2:</b> Callus culture. Cell Suspension culture. Somaclonal variation. Mutant selection, Secondary metabolite production from plant cell cultures, Biotransformations.</p>	30	<p>Dr. V. A. Bapat Dr. S. G. Dalavi Prof. N.S. Desai Dr. S. R. Pai Shri. V. B. Chavan Shri. S. M. Chavare Dr. S. A. Patil Dr. R. V. Gurav Dr. N.B. Gaikwad Dr. S. G. Ghane Dr. M. S. Nimbalkar Dr. N. V. Pawar</p>	45,000.00

Prof. S. H. H. H.  
Department of  
Shivaji University,  
Kodli Road, Shivajinagar, Pune


“Commercialization of important plants through tissue culture”

Time Table

TIME/DAY	Wednesday 04/07/18	Thursday 05/07/18	Friday 06/07/18	Saturday 07/07/18	Sunday 08/07/18	Monday 9/07/18	Tuesday 10/07/18
11:00 – 12:00	NVP	VAB	NVP	NSD		SMC	SGG
12:00 – 01:00	MSN	NBG	VBC	SRP		SAP	RVG
01:00 – 01:30	Recess						
01:30 To 04:30	Stock and Media Preparation (MPM - RSP)	Sterilization Techniques (JPG - KSW)	Microprop- ogation (AVM - ASN)	Embryo rescue (PSK)		Green House Operations (SHN - SAW)	Hardening (MVP - VET)

**Resource Persons for Lecture**

NVP	:	Dr. Nilesh Pawar	SMC	:	Mr. S. M. Chavare
VAB	:	Prof. V. A. Bapat	SGG	:	Dr. S. G. Ghane
NSD	:	Prof. N. S. Desai	MSN	:	Dr. M. S. Nimbalkar
NBG	:	Dr. N. B. Gaikwad		:	
VBC	:	Mr. V. B. Chavan	SRP	:	Dr. S. R. Pai
RVG	:	Dr. R. V. Gurav	SAP	:	Dr. S. A. Patil
<b>Resource Persons for Practical/ Demonstration</b>					
SHN		S. H. Nimbalkar	RSP		R. S. Patil
VET		V. E. Tambekar	MVP		M. V. Powar
MPM		M. P. Mane	SAW		S. A. Warake
AVM		A. V. Mohite	JPG		J. P. Gadade
ASN		A. S. Nalawade	KSW		K. S. Walvekar

  
 Prof. S. H. Nimbalkar  
 Department of Botany,  
 Shivaji University,  
 Kolhapur.



Department of Physics  
Shivaji University, Kolhapur  
**Value Added Course**  
**Instrumentation in Physical Sciences**  
(9<sup>th</sup> July-13<sup>th</sup> July 2018)

**Schedule**

**Day One**

**(Monday, 9<sup>th</sup> July 2018)**

**Session I (11:00 am-12:30 pm)**

Instrumentation for Structural Studies in Material Science

**Prof. (Dr.) K. Y. Rajpure**

Department of Physics, Shivaji University, Kolhapur

**Session II (12:30 pm-2:00 pm)**

Optical Microscope against Electron Microscope

**Dr. A. V. Moholkar**

Department of Physics, Shivaji University, Kolhapur

**BREAK (2:00 pm-2:30 pm)**

**Session III (2:30 pm-4:00 pm)**

Solar cell Instrumentation

**Prof. (Dr.) C. H. Bhosale**

Former HOD (Physics), Shivaji University, Kolhapur

**Session IV (4:00 pm-5:30 pm)**

Importance of Instrumentation in Physical Sciences

**Prof. (Dr.) P. S. Patil**

Coordinator, SNST & Dean, Faculty of Science and Technology,  
Shivaji University, Kolhapur

**Day Two**  
**(Tuesday, 10<sup>th</sup> July 2018)**

**Session I (11:00 am-12:30 pm)**  
Role of Radiations in Instrumentation

**Prof. (Dr.) R. G. Sonkawade**  
Department of Physics, Shivaji University, Kolhapur

**Session II (12:30 pm-2:00 pm)**  
Instrumentation in Space Science

**Prof. (Dr.) V. R. Puri**  
Department of Physics, Shivaji University, Kolhapur

**BREAK (2:00 pm-2:30 pm)**

**Session III (2:30 pm-4:00 pm)**  
Morphological Studies in Material Science

**Dr. N. G. Deshpande**  
DST INSPIRE Faculty  
Department of Physics, Shivaji University, Kolhapur

**Session IV (4:00 pm-5:30 pm)**  
Deposition Techniques and Instrumentation

**Dr. N. L. Tarwal**  
Department of Physics, Shivaji University, Kolhapur

**Day Three**  
**(Wednesday, 11<sup>th</sup> July 2018)**

**Session I (11:00 am-12:30 pm)**

Instrumentation Systems

**Prof. (Dr.) P. N. Vasambekar**

Department of Electronics, Shivaji University, Kolhapur

**Session II (12:30 pm-2:00 pm)**

Wireless Sensor Network And Biomedical Applications

**Dr. M. K. Bhanarkar**

Department of Electronics, Shivaji University, Kolhapur

**BREAK (2:00 pm-2:30 pm)**

**Session III (2:30 pm-4:00 pm)**

Analytical Instrumentation

**Prof. (Dr.) A. V. Ghule**

Department of Chemistry, Shivaji University, Kolhapur

**Session IV (4:00 pm-5:30 pm)**

Data Analysis and Simulations using Mathematica

**Dr. M. V. Takale**

Department of Physics, Shivaji University, Kolhapur

**Day Four**  
**(Thursday, 12<sup>th</sup> July 2018)**

**Session I (11:00 am-12:30 pm)**  
Instrumentation and Statistical Analysis  
**Dr. D. M. Sakate**  
Department of Statistics, Shivaji University, Kolhapur

**Session II (12:30 pm-2:00 pm)**  
**Prof. (Dr.) C. D. Lokhande**  
Research Director  
Dr. D. Y. Patil University, Kolhapur

**BREAK (2:00 pm-2:30 pm)**

**Session III +IV (2:30 pm-4:30 pm)**  
Spectroscopy & Instrumentation  
**Prof. (Dr.) S. H. Behere**  
Former HOD (Physics)  
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

**Day Five**  
**(Friday, 13<sup>th</sup> July 2018)**

**Session I (11:00 am-12:30 pm)**

Accelerators Physics  
**Prof. (Dr.) N.M. Badigar**  
Karnataka University, Dharwad

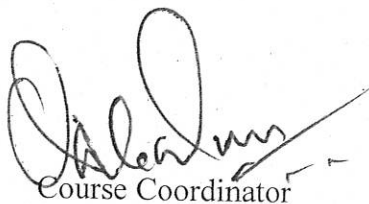
**Session II (12:30 pm-2:00 pm)**

Infrastructural Facilities in USIC  
**Dr. J. B. Yadav**  
Scientific Officer  
USIC, Shivaji University, Kolhapur

**BREAK (2:00 pm-2:30 pm)**

**Session III+IV (2:30 pm-5:00 pm)**

Course Evaluation (Objective Test)  
and  
Feedback of the Value Added Course



Course Coordinator  
Department of Physics  
Shivaji University, Kolhapur



Head  
Department of Physics  
Shivaji University, Kolhapur  
**Prof. & Head,**  
**Department of Physics**  
Shivaji University  
Kolhapur

## Name of Department: Agrochemicals and Pest Management

Date: 21-05-2018

No.	Title t of Value Added Course	Curriculum of Course	Total Hrs	List of Experts	Approx. Exp.
1)	<p style="text-align: center;"><b>CERTIFICATE COURSE IN INTEGRATED PEST MANAGEMENT</b></p>	<p><b>Unit I: Pathology</b></p> <p>a) Plant pathology and soil science Basic concept of disease, plant diseases based on different pathogen (Bacteria, fungi, Virus, MLO, Nematodes etc.) Symptoms, Study of following disease and its management: - Leaf spots, Rusts, Smuts, Wilt, Damping off, powdery mildews, downy mildews, sooty mildews, rots. Etc.</p> <p>b) Soil Science: - Physical properties of soil, composition, soil organism soil fertility and plant nutrition, problematic soil.</p> <p>c) Manures and Fertilizers: - Organic manures, inorganic fertilizers, Bio fertilizers, Fate of plan nutrients in soil, Fertilizers characteristics and their selection.</p> <p>d) Agriculture and Rural development scheme</p> <p><b>Practical:</b></p> <ul style="list-style-type: none"> <li>• Determination of moisture content in soils.</li> <li>• Determination of pH of soils.</li> <li>• Determination of total nitrogen in soils.</li> <li>• Determination of available phosphorus, potassium by/ volumetric/ colorimetric/ gravimetric method</li> <li>• Study of few plant diseases.</li> </ul>	15	<ol style="list-style-type: none"> <li>1. Prof. S. S. Chavan</li> <li>2. Prof. M. B. Deshmukh</li> <li>3. Dr. T. G. Nagraja</li> <li>4. Dr. P. D. Shirgave</li> <li>5. Dr. M. V. Santhakumar</li> <li>6. Dr. P. B. Mohite</li> <li>7. Dr. S. R. Yankanchi</li> <li>8. Dr. S. G. Deshpande</li> <li>9. Dr. K. Banerjee</li> <li>10. Dr. S. D. Sawant</li> <li>11. Dr. A. D. Jadhav</li> <li>12. Dr. A. R. Patil</li> <li>13. Dr. M. D. Sagare</li> <li>14. Dr. Shamrao Jahagiridar</li> </ol>	30,000/-

	<p><b>Unit II: Entomology</b></p> <p>a) Basic concepts, damage caused by Insect pests symptom and management</p> <p>b) IPM- Pest management, integration of tactics farmer's participation IPM program study of following pest and its management pests on cereals , millets, pulses, vegetables sugarcane crop and oil seed crops.</p> <p>c) Pesticide chemistry- Introduction of different Pesticide: Insecticide, Nematicides fungicides, Weedicide, Rodenticide, Molluscicide, Acaricide etc</p> <p>d) Pesticide application Equipment's, pattern of pesticide consumption, environmental impact of pesticides, Pesticide poisoning, pesticide residues.</p> <p><b>Practical:</b></p> <ul style="list-style-type: none"> <li>• Study of following few pests: Caterpillars, moths, beetle, flies, Aphids, Jassids, Bugs, etc.</li> <li>• Study of pesticide: e.g. : Insecticide, Fungicide, Herbicide, Nematicides, Rodenticide,</li> </ul>	15		
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Sign 

**CO-ORDINATOR,**  
**DEPARTMENT OF AGROCHEMICALS**  
**AND PEST MANAGEMENT,**  
**SEVAI UNIVERSITY, KOLHAPUR-416 004**