

B. L. D. E Association's
S. B Arts and K. C. P Science College,
Vijayapur



Department of PG Studies in Physics

SKILL BASED VALUE ADDED COURSE
FOR
THIRD SEMESTER PG STUDENTS OF PHYSICS
(For the Academic Year 2022-23)

Course Name: Instrumentation

(Course Code: SBKCP/PGPHY/VAC/01)

B. L. D. E. Association's
S. B Arts and K. C. P Science College, Vijayapur
Department of PG Studies in PHYSICS
Value Added Course 2022-2023
Course Name: Instrumentation
Course Code: SBKCP/PGPHY/VAC/01

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**B. L. D. E. ASSOCIATION'S
S. B. ARTS AND K. C. P. SCIENCE COLLEGE**

Smt. Bangaramma Sajjan Campus, Shri B. M. Patil Road (Solapur Road), Vijayapur-586 103

Accredited with CGPA of 2.99 at 'B' Grade in 4th Cycle by NAAC

(Affiliated to Rani Channamma University, Belagavi)

Phone: (08352) 262770, Extn. 2223, 2224 Website: www.bldeasbkcp.ac.in E-mail: bldeasbkcp@gmail.com



REF.: _____

Date: 16-Nov-2022

Department of PG Studies in Physics

Value Added Course: 2022-2023

NOTICE

This notice is to inform about Value Added course for the year 2022-2023.

All M. Sc III Sem Physics students are requested to enroll their names in the department.

Last date for the submission of enrollment forms is 25th of November 2022.

B. L. D. E.
Coordinator
Co-ordinator

Department of PG Studies in Physics
S.B. Arts and KCP Science College
VIJAYAPUR

[Signature]
IQAC Coordinator

IQAC, Co-ordinator
S.B.Arts & K.C.P.Science College,
Vijayapur,

[Signature]

Principal

Principal,
S.B. Arts and KCP Science College
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Value Added Course

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Objective: The main objective of the course is to make the students understand the Principle and Theory of instruments.

Scope: This course has wide scope and after completion of M. Sc it helps students in Research and Teaching.

Syllabus

Total Duration of Teaching: 30 Hours

Duration of Teaching per week: 02 Hours

Theory Syllabus

Total hours allotted: 20 hours

Unit: I

5hrs

Structural and composition characterization: Basics of X-ray diffraction (XRD), powder XRD, Transmission Electron Microscope (TEM), Scanning Electron Microscope (SEM), Atomic Force Microscopy (AFM), and Scanning Tunneling Microscopy (STM).

Unit: II

5hrs

Optical spectroscopy and Raman Spectroscopy: Fourier Transform Infrared Spectroscopy (FTIR), UV-Vis. Spectroscopy, and Raman Spectroscopy, Raman and IR spectroscopy, structure determination by IR and Raman spectroscopy.

Unit: III

8hrs

Electric and thermal measurements: a. c and d. c electrical conductivity measurements as a function of temperature and frequencies. Magneto resistance measurements, specific heat measurements, Impedance spectroscopy: A. C. impedance spectroscopy, Thermo Gravimetric analysis (TGA), differential thermal analysis (DTA) and differential scanning calorimetric (DSC) analysis.

Unit: IV

2hrs

Nuclear Detectors: Scintillation detector- NaI (TI) gamma ray spectrometer; Principle, working and energy resolution. Semiconductor detectors.

Text Books:

1. Physics of Atoms and Molecules: 2nd Ed., Brans den B.H. and Joachim C. J., Pearson Education, India (2006).
2. Elementary Atomic Structure (2nd ed.): G. K. Wood gate, Clarendon Press, Oxford (1980).
3. Molecular Spectra & Molecular Structure: Vol- I, Herzberg, D. VanNo strand Co. Princeton, J. J. (1945).
4. Spectroscopy – Vol. 3, S. Walker & B. P. Strauhghan, Chapman & Hall,(1976).
5. Fundamentals of Molecular Spectroscopy: C. N. Barnwell and E. M. McCash, Tata Mc Graw- Hill Co., 4th revised edition, (9th reprint, 2000)

Practical Syllabus:

Total hours allotted: 10 hours

List of experiments (Each practical of two hours)

1. Hall effect in metals
2. Determination of Magnetoresistance
3. Temperature Dependence of Hall Coefficient.
4. Determination of e/K_F .
5. Determination of band gap of semiconductors using Four probe Method.

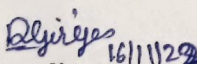
Evaluation:

Students will be evaluated through the examination conducted by the physics department at the end of the course and they will be awarded course certificate accordingly.

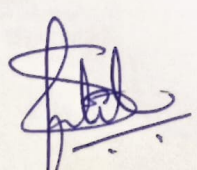
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List of Faculty

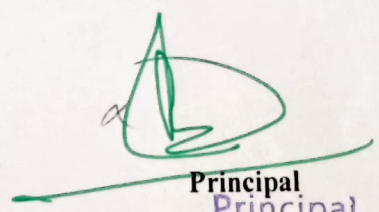
- 1. Dr. Girija M. Nimbal**
- 2. Prof. Basavajyoti A. Patil**


Coordinator

Co-ordinator
Department of PG Studies in Physics
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IQAC Coordinator

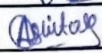
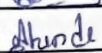
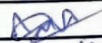
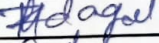
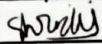
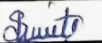
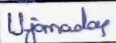
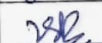
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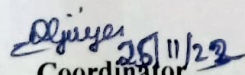

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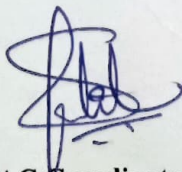
List of Students Enrolled

Roll. No	Candidate's Name	Sign
1	Abid Mahebusab Bagwan	
2	Aishwarya Shitole	
3	Ambika Shende	
4	Aruna Hadimani	
5	Atharullah Balganur	
6	Gururaj Muchandi	
7	Kartik Pattanshetti	
8	Daneshwari D Hawaldarmath	
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Coordinator

Co-ordinator

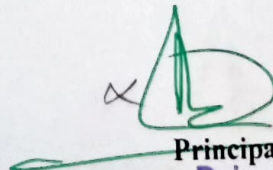
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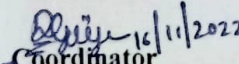
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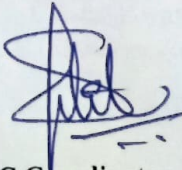
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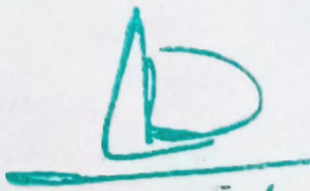
Time Table

Time\Days	Friday	Saturday
08.30 am - 09.30 am	Theory	Practical
09.30 am - 10.30 am	Theory	


Coordinator
16/11/2022

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Date: 06/Mar/2023

Department of PG Studies in Physics

Value Added Course: 2022- 2023

NOTICE

The Value added Course 2022-2023 Theory and Practical Examinations will be conducted on the below dates. All the students attend both the exams without fail.

	Date	Time
Theory	09/Mar/2023	09.30 am – 10.30 am
Practical	10/Mar/2023	08.30 am – 10.30 am

Signature 6/3/2023

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Co-ordinator**

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IQAC, Co-ordinator**

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Theory Test Question Paper

Maximum Marks: 50 Marks

I. Answer any 06 questions each carrying 05 marks. (5m x 6q = 30m)

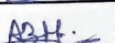
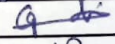
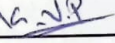
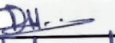
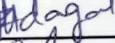
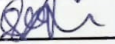
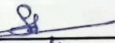
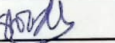
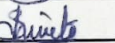
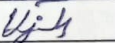
1. Explain the basic principle underlying working of SEM.
2. Explain the construction of Scanning Tunneling Microscopy (STM) with neat diagram.
3. Give the difference between SEM and TEM.
4. Describe the importance of optical spectroscopy.
5. Explain UV –Vis Spectroscopy.
6. Give the difference between IR and Raman spectroscopy.
7. What is the importance of a. c and d. c conductivity measurement?
8. Explain differential thermal analysis (DTA).

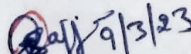
II. Answer any 02 questions each carrying 10 marks. (10m x 2q = 20m)

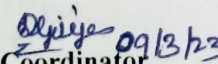
1. Explain construction and working of powder XRD.
2. Explain the structure determination by Raman spectroscopy.
3. Explain a. c impedance spectroscopy.
4. Explain the principle and working of Scintillation detector- NaI (TI) gamma ray spectrometer.

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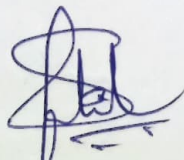
Examination Attendance (Theory)

Roll.No	Candidate's Name	Sign
1	Abid Mahebusab Bagwan	
2	Aishwarya Shitole	
3	Ambika Shende	
4	Aruna Hadimani	
5	Atharullah Balganur	
6	Gururaj Muchandi	
7	Kartik Pattanshetti	
8	Daneshwari D Hawaldarmath	
9	Praveen G Adagal	
10	Sagar Panalakar	
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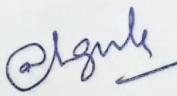

Supervisor


Co-ordinator

Department of PG Studies in Physics
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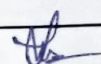
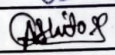
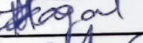

IQAC Co-ordinator

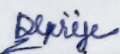
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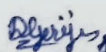

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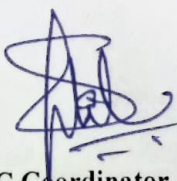
Examination Attendance (Practical)

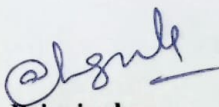
Roll.No	Candidate's Name	Sign
1	Abid Mahebusab Bagwan	
2	Aishwarya Shitole	
3	Ambika Shende	
4	Aruna Hadimani	
5	Atharullah Balganur	
6	Gururaj Muchandi	
7	Kartik Pattanshetti	
8	Daneshwari D Hawaldarmath	
9	Praveen G Adagal	
10	Sagar Panalakar	
11	Sevanti B Patil	
12	Shridevi Khedagi	
13	Shwetashree Nagaraddi	
14	Umarfaruk Jamadar	
15	Vrunda Sanjeev Deshmukh	

 10/3/23
Supervisor

 10/3/23
Coordinator

Co-ordinator
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Marks List

Maximum Marks: 100

Roll No.	Candidate's Name	Theory(60)	Practical(40)	Total	Sign
1	Abid Mahebusab Bagwan	40	45	85	
2	Aishwarya Shitole	46	47	93	
3	Ambika Shende	36	40	76	
4	Aruna Hadimani	40	42	82	
5	Atharullah Balganur	40	39	79	
6	Gururaj Muchandi	42	45	87	
7	Kartik Pattanshetti	47	45	92	
8	Daneshwari D Hawaldarmath	46	44	90	
9	Praveen G Adagal	36	35	71	
10	Sagar Panalakar	41	38	79	
11	Sevanti B Patil	40	42	82	
12	Shridevi Khedagi	46	40	86	
13	Shwetaashree Nagaraddi	36	34	70	
14	Umarfaruk Jamadar	35	34	69	
15	Vrunda Sanjeev Deshmukh	34	36	70	

Coordinator 13/3/23

Co-ordinator
Department of PG Studies in Physics
S. B. Arts and KCP Science College
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Marks List

Maximum Marks: 100

Roll No.	Candidate's Name	Theory(50)	Practical(50)	Total
1	Abid Mahebusab Bagwan	40	45	85
2	Aishwarya Shitole	46	47	93
3	Ambika Shende	36	40	76
4	Aruna Hadimani	40	42	82
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12	Shridevi Khedagi	46	40	86
13	Shwetashree Nagaraddi	36	34	70
14	Umarfaruk Jamadar	35	34	69
15	Vrunda Sanjeev Deshmukh	34	36	70

Depiyes
Coordinator 13/3/2023

Co-ordinator

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IQAC, Co-ordinator

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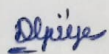
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Course Outcome

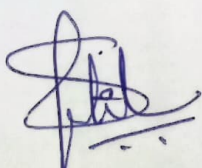
A value added course on Instrumentation for the year 2022-2023 was conducted in Department of PG studies in Physics for M. Sc. Final year students. The course was conducted between 26 November 2022 and 10 March 2023. Faculty from department of PG studies in Physics conducted the classes.

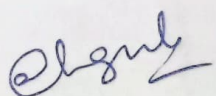
In this course students were familiarized with the theory and the principle involved in the instruments equipped for the characterization of the materials. This is helpful for them in future for research and teaching as well.

The understanding of the students towards this course was evaluated by both theory and Practical examination. And certificates were issued at the end of the course.


Coordinator

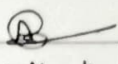
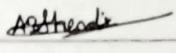
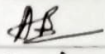
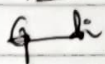
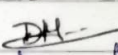
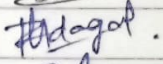
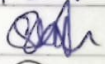
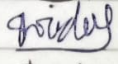
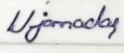
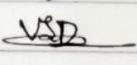
Co-ordinator
Department of PG Studies in Physics
S.B. Arts and KCP Science College
VIJAYAPUR


IQAC Coordinator
IQAC, Co-ordinator
S.B.Arts & K.C.P.Science College,
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Principal,
S.B. Arts and KCP Science College
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S.B. Arts & K.C.P. Science College, Vijayapur
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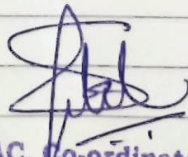
VALUE ADDED COURSE (VAC) 2022-2023
ISSUE OF CERTIFICATE TO STUDENTS

Roll No	Student Name	Signature
01	Abid Bagwan	
02	Aishwarya Shitole	
03	Ambika Shende	
04	Asuna Hadimani	
05	Atharullah Balaganur	
06	Gururaj Muchandi	
07	Kartik Pattanshetti	
08	Daneshwari D. Hawaldarmath	
09	Praveen G. Adagal	
10	Sagar Panalakar	
11	Sevanti B. Patil	
12	Shridevi Khedagi	
13	Shwetashree Nagaraddi	
14	Umarfaruk Jamadar	
15	Vrunda Sanjeev Deshmukh	

Bl/13/2023

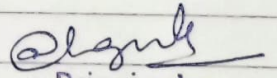
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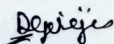
Department of PG Studies in Physics

VALUE ADDED COURSE

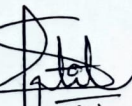
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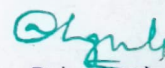
This is to certify that, Mr/Ms Aruna Hadimani
has successfully completed the Value Added Course on "Instrumentation"
conducted by Department of PG Studies in Physics, BLDEA's S. B. Arts and K. C. P. Science
College, Vijayapur during the year 2022-2023

Date: 13/3/2023

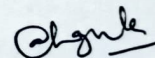

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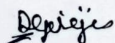
CERTIFICATE

This is to certify that, Mr/Ms Ambika Shende

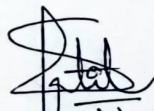
has successfully completed the Value Added Course on "Instrumentation"

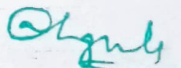
conducted by Department of Pg Studies in Physics, BLDEA's S. B. Arts and K. C. P. Science
College, Vijayapur during the year 2022- 2023

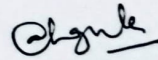
Date: 13/3/2023


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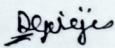
Department of Pg Studies in Physics

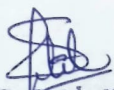
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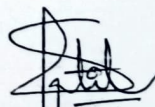
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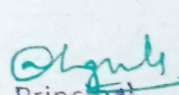
This is to certify that, Mr/Ms Aishwarya Shitole
has successfully completed the Value Added Course on "Instrumentation"
conducted by Department of Pg Studies in Physics, BLDEA's S. B. Arts and K. C. P. Science
College, Vijayapur during the year 2022- 2023

Date: 13/3/2023


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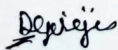
Department of PG Studies in Physics

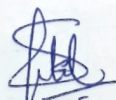
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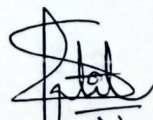
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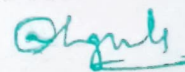
This is to certify that, Mr/Ms Abid M Bagwan
has successfully completed the Value Added Course on "Instrumentation"
conducted by Department of PG Studies in Physics, BLDEA's S. B. Arts and K. C. P. Science
College, Vijayapur during the year 2022- 2023

Date: 13/3/2023

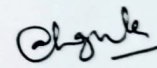

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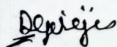
CERTIFICATE

This is to certify that, Mr/Ms Atharullah Balganur

has successfully completed the Value Added Course on 'Instrumentation'

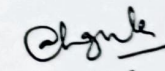
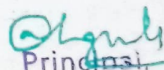
conducted by Department of PG Studies in Physics, BLDEA's S. B. Arts and K. C. P. Science College, Vijayapur during the year 2022-2023

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