

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 2020-21)**

**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 2020-2021  
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,**

SHRI B. M. PATIL ROAD (Solapur Road), VIJAYAPUR

ACCREDITED at 'A' Grade in 3<sup>rd</sup> Cycle by NAAC

Phone: (08352) – 261766, (08352) 262770 Extn. 2223, 2224

Fax: 08352 – 261766 E-mail: [bldeasbkcp@gmail.com](mailto:bldeasbkcp@gmail.com) Web: [www.bldeasbkcp.org](http://www.bldeasbkcp.org)



REF.: \_\_\_\_\_

Date: 18-Nov-2020

**Department of PG Studies in Physics**

**Value Added Course: 2020-2021**

**NOTICE**

This notice is to inform about Value Added course for the year 2020-2021. All M. Sc III Sem Physics students are requested to enroll their names in the departments on or before 21<sup>st</sup> of November 2020. Last date for the submission of enrollment forms is 24<sup>th</sup> of November 2020.



**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,**  
**Vijayapur.**



**Principal**  
**Principal,**  
**S.B. Arts and KCP Science College**  
**VIJAYAPUR**

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

Course Name: Instrumentation

Course Code: SBKCP/PGPHY/VAC/01

**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: 50 Hours

Duration of Teaching per week: 02 Hours

Theory Syllabus

Total hours allotted: 30 hours

Unit:I

**Structural and composition characterization:** Basics of X-ray diffraction (XRD), powder XRD, Transmission Electron Microscope (TEM), Scanning Electron Microscope (SEM), Atomic Force Microscopy (AFM), Scanning Tunneling Microscopy (STM). 5hrs

Unit:II

**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. 5hrs

Unit:III

**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. 8hrs

Unit:IV

**Nuclear Detectors:** Scintillation detector- NaI(Tl) gamma ray spectrometer; Principle, working and energy resolution. Semiconductor detectors. 2hrs

**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: 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  $e/K_b$ .
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. Soumya Sajjan



Coordinator

Co-ordinator

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



IQAC Coordinator

**IQAC, Co-ordinator**  
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Department of PG Studies in PHYSICS  
Value Added Course 2020-2021  
Course Name: Instrumentation  
Course Code: SBKCP/PGPHY/VAC/01

List of Students Enrolled

Roll.No	Candidate's Name	Sign
1	Aishwarya Attalatti	A.A. Attalatti
2	Aishwaryalaxmi Gatade	A. Gatade
3	Annapurna Basappa Parappanavar	Annapurna
4	Arati Narasagoudar	A. Narasagoudar
5	Laxmi Ashok Desai	L. Desai
6	Nivedita Hiremath	N. Hiremath
7	Pooja Mane	P. Mane
8	Prabhudeva	P. Prabhudeva
9	Prajakta Alagouda	P. Alagouda
10	Pramod Virupakshappa Bilur	P. V. Bilur
11	Prateek Kaladagi	P. Kaladagi
12	Shilpa Veerabasappa Bandi	S. V. B.
13	Shruti Paragouda	S. M. Paragouda
14	Shweta S Holi	S. Holi
15	Umerabanu Abdulkhadar Shaikh	U. Shaikh
16	Vidyashree Yandolli	V. Yandolli
17	Vinayasheela Kallappa Savanure	V. Savanure
18	Vishalasi Bendigeri	V. Bendigeri



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Time Table

Time\Days	Friday	Saturday
02.00 pm - 04.00 pm	Practical	Practical
04.00 pm – 05.00 pm	Theory	Theory



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Principal  
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S.B. Arts and KCP Science College  
VIJAYAPUR

Value added course (VAC)  
2020-21

B.L.D.E.

**STUDENT ATTENDANCE**

Sl. No.	Name	1	2	3	4	5	6	7	8	9	10	11	12	13
1)	Aishwarya Attalatti	A	A	A	A	A	A	A	A	A	A	A	A	A
2)	Aishwarya Atami Galade	A	A	A	A	A	A	A	A	A	A	A	A	A
3)	Annappurna Parappanava	A	A	A	A	A	A	A	A	A	A	A	A	A
4)	Arati Narasagoudar	A	A	A	A	A	A	A	A	A	A	A	A	A
5)	Laxmi Desai	A	A	A	A	A	A	A	A	A	A	A	A	A
6)	Nivedita Hiramath	A	A	A	A	A	A	A	A	A	A	A	A	A
7)	Pooja Mane	A	A	A	A	A	A	A	A	A	A	A	A	A
8)	Prabhudewa	A	A	A	A	A	A	A	A	A	A	A	A	A
9)	Prajakta Alogouda	A	A	A	A	A	A	A	A	A	A	A	A	A
10)	Pramod Bilur	A	A	A	A	A	A	A	A	A	A	A	A	A
11)	Prateek Kaladagi	A	A	A	A	A	A	A	A	A	A	A	A	A
12)	Shilpa Bandi	A	A	A	A	A	A	A	A	A	A	A	A	A
13)	Shruti Paragouda	A	A	A	A	A	A	A	A	A	A	A	A	A
14)	Shweta S. Hali	A	A	A	A	A	A	A	A	A	A	A	A	A
15)	Umeshabau Shaikh	A	A	A	A	A	A	A	A	A	A	A	A	A
16)	Vidyashree Vandalli	A	A	A	A	A	A	A	A	A	A	A	A	A
17)	Vinayashree Sanganur	A	A	A	A	A	A	A	A	A	A	A	A	A
18)	Vishalaxi Bendiger	A	A	A	A	A	A	A	A	A	A	A	A	A
		21/11/20	23/11/20	28/11/20	30/11/20	1/12/20	4/12/20	7/12/20	12/12/20	15/12/20	19/12/20	21/12/20	25/12/20	27/12/20

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Association's

Theory classes

**REGISTER**

Sl. No.	Name	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	No. of days late	No. of days Present	Date of Original Admission of the class or of promotion
1)	Aishwarya Attalatti	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
2)	Aishwarya Atami Galade	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
3)	Annappurna Parappanava	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
4)	Arati Narasagoudar	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
5)	Laxmi Desai	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
6)	Nivedita Hiramath	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
7)	Pooja Mane	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
8)	Prabhudewa	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
9)	Prajakta Alogouda	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
10)	Pramod Bilur	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
11)	Prateek Kaladagi	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
12)	Shilpa Bandi	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
13)	Shruti Paragouda	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
14)	Shweta S. Hali	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
15)	Umeshabau Shaikh	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
16)	Vidyashree Vandalli	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
17)	Vinayashree Sanganur	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
18)	Vishalaxi Bendiger	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
		29/12/20	30/12/20	31/12/20	1/1/21	2/1/21	3/1/21	4/1/21	5/1/21	6/1/21	7/1/21	8/1/21	9/1/21	10/1/21	11/1/21	12/1/21	13/1/21	14/1/21	15/1/21			

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VIJAYAPUR



Value added course (VAC)

BLDE

2020-21

STUDENT ATTENDANCE

Sl. No.	Name	1	2	3	4	5	6	7	8	9	10	11	12	13
1)	Aishwarya Allalati	AS	AS	AS	AS	AS	AS							
2)	Aishwaryalaxmi Galade	AS	AS	AS	AS	AS	AS							
3)	Annapurna Parappanaru	AS	AS	AS	AS	AS	AS							
4)	Asati Narayagundar	AS	AS	AS	AS	AS	AS							
5)	Laxmi Desai	AS	AS	AS	AS	AS	AS							
6)	Nivedita Himmath	AS	AS	AS	AS	AS	AS							
7)	Pooja Mane	AS	AS	AS	AS	AS	AS							
8)	Prabhudatta	AS	AS	AS	AS	AS	AS							
9)	Prajakta Naganda	AS	AS	AS	AS	AS	AS							
10)	Pramod Bilur	AS	AS	AS	AS	AS	AS							
11)	Prateek Kaladagi	AS	AS	AS	AS	AS	AS							
12)	Shilpa Bandi	AS	AS	AS	AS	AS	AS							
13)	Shanti Paraganda	AS	AS	AS	AS	AS	AS							
14)	Shweta S Hol	AS	AS	AS	AS	AS	AS							
15)	Umeshbenu Shaikh	AS	AS	AS	AS	AS	AS							
16)	Vidyashree Yandole	AS	AS	AS	AS	AS	AS							
17)	Vinayashree Savanur	AS	AS	AS	AS	AS	AS							
18)	Vishalaxr Bendigui	AS	AS	AS	AS	AS	AS							
		11/12/20	11/12/20	11/12/20	11/12/20	11/12/20	11/12/20							
		11/12/20	11/12/20	11/12/20	11/12/20	11/12/20	11/12/20							

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

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

Association's

REGISTER

Practicals

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	No. of days absent	No. of days Present	Date of Original Admission of the class -	

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REF./ PÄæªÄiÄAPÄ : \_\_\_\_\_

Date /ç£ÄAPÄ: 03/Mar/2021

**Department of PG Studies in Physics**

**Value Added Course: 2020- 2021**


**NOTICE**


The Value added Course 2020-2021 theory and Practical Examinations will be conducted on the below dates. All the students attend both the exams without fail.

	Date	Time
Theory	12/Mar/2021	2pm to 5.00 pm
Practical	13/Mar/2021	2pm to 6.00 pm

  
Coordinator  
Co-ordinator

Department of PG Studies in Physics  
S.B..Arts and KCP Science College  
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**Theory Test Question Paper**

**Maximum Marks: 60 Marks**

**I. Answer any 08 questions each carrying 05 marks. (5m x 8q = 40m)**

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

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

11. Explain different methods of XRD analysis.
12. Explain the structure determination by Raman spectroscopy.
13. Explain Thermo Gravimetric analysis (TGA).
14. Explain a. c impedance spectroscopy.




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Examination Attendance (Theory)

Roll.No	Candidate's Name	Sign
1	Aishwarya Attalatti	A.A.Attalatti
2	Aishwaryalaxmi Gatade	A.Gatade
3	Annapurna Basappa Parappanavar	Annapurna
4	Arati Narasagoudar	A.Narasagoudar
5	Laxmi Ashok Desai	L.A.Desai
6	Nivedita Hiremath	N.Hiremath
7	Pooja Mane	P.Manee
8	Prabhudeva	P.Prabhudeva
9	Prajakta Alagouda	P.Alagouda
10	Pramod Virupakshappa Bilur	P.V.Bilur
11	Prateek Kaladagi	P.Kaladagi
12	Shilpa Veerabasappa Bandi	S.V.Bandi
13	Shruti Paragouda	S.Paragouda
14	Shweta S Holi	S.Holi
15	Umerabanu Abdulkhadar Shaikh	U.Abdulkhadar Shaikh
16	Vidyashree Yandolli	V.Yandolli
17	Vinayasheela Kallappa Savanure	V.Kallappa Savanure
18	Vishalakshi Bendigeri	V.Bendigeri

  
Co-ordinator

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Examination Attendance (Practical)

Roll.No	Candidate's Name	Sign
1	Aishwarya Attalatti	A. Attalatti
2	Aishwaryalaxmi Gatade	A. Gatade
3	Annapurna Basappa Parappanavar	Annapurna
4	Arati Narasagoudar	A. Narasagoudar
5	Laxmi Ashok Desai	L. Desai
6	Nivedita Hiremath	N. Hiremath
7	Pooja Mane	P. Mane
8	Prabhudeva	P. Prabhudeva
9	Prajakta Alagouda	P. Alagouda
10	Pramod Virupakshappa Bilur	P. V. Bilur
11	Prateek Kaladagi	P. Kaladagi
12	Shilpa Veerabasappa Bandi	S. V. Bandi
13	Shruti Paragouda	S. Paragouda
14	Shweta S Holi	S. Holi
15	Umerabanu Abdulkhadar Shaikh	U. Shaikh
16	Vidyashree Yandolli	V. Yandolli
17	Vinayasheela Kallappa Savanure	V. Savanure
18	Vishalasi Bendigeri	V. Bendigeri

  
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Marks List

Maximum Marks: 100

Roll No.	Candidate's Name	Theory(60)	Practical(40)	Total	Sign
1	Aishwarya Attalatti	45	38	83	Ae Attalatti
2	Aishwaryalaxmi Gatade	44	36	80	Aishwaryalaxmi
3	Annapurna Basappa Parappanavar	50	39	85	Annapurna
4	Arati Narasagoudar	46	38	84	Arati Narasagoudar
5	Laxmi Ashok Desai	45	37	82	Laxmi Ashok Desai
6	Nivedita Hiremath	46	36	82	Nivedita
7	Pooja Mane	47	39	86	Pooja Mane
8	Prabhudeva	48	39	87	Prabhudeva
9	Prajakta Alagouda	47	39	86	Prajakta Alagouda
10	Pramod Virupakshappa Bilur	48	39	87	Pramod Virupakshappa Bilur
11	Prateek Kaladagi	48	39	88	Prateek Kaladagi
12	Shilpa Veerabasappa Bandi	48	39	87	Shilpa Veerabasappa Bandi
13	Shruti Paragouda	47	37	84	Shruti Paragouda
14	Shweta S Holi	48	36	84	Shweta S Holi
15	Umerabanu Abdulkhadar Shaikh	49	39	88	Umerabanu Abdulkhadar Shaikh
16	Vidyashree Yandolli	48	38	86	Vidyashree Yandolli
17	Vinayashree Kallappa Savanure	48	39	87	Vinayashree Kallappa Savanure
18	Vishalakshi Bendigeri	48	39	87	Vishalakshi Bendigeri

  
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Co-ordinator

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IQAC, Co-ordinator

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Course Outcome

A value added course on Instrumentation for the year 2020-2021 was conducted in Department of PG studies in Physics for M. Sc Final year students. The course was conducted between 27 November 2020 and 10 March 2021. Dr. Girija M. Nimbal and Prof. Soumya Sajjan, Assistant Professors of the department 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 the 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.



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IQAC, Co-ordinator

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