

**NAAC**  
Accreditation  
Cycle - 3

**SSR**  
Documents



# THUNCHAN MEMORIAL GOVT. COLLEGE, TIRUR

Vakkad P.O., Malappuram (Dist), Kerala  
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Criterion 1  
Curricular Aspects

## 1.2.1



Add on Courses  
Department of Physics  
2019-20



**DEPARTMENT OF PHYSICS**

**T M GOVT COLLEGE, TIRUR**

# **ADD ON COURSE 2019-20**

*Add on course on Energy Harvesting from Renewable Energy Sources*

*Add on course on Introduction to Scientific Computing*

*Add on Course on Material Characterization Techniques*

**Prospectus and Syllabus of  
Add on Course in**

**ENERGY HARVESTING FROM RENEWABLE RESOURCES  
for  
First year BSc Physics**



**Thunchan Memorial Govt. College, Tirur**

**Vakkad PO, Malappuram**

THUNCHAN MEMORIAL GOVT. COLLEGE, TIRUR  
DEPARTMENT OF PHYSICS

ADD ON COURSE (TMGCPHY AC2)

ENERGY HARVESTING FROM RENEWABLE RESOURCES

Course objectives:

To provide an overview of the important renewable energy resources and harnessing technologies. Nowadays the energy requirement of the society is high but the conventional sources of energy is not enough for it. So this course is intended for first year BSc Physics students to understand the importance of non-conventional energy sources.

Duration of the course : 30 Hours  
Total Credits : 4

TOTAL HOURS :30

TOTAL MODULES: 4

MODULE 1 ( 8 HOURS)

Solar constants, Solar radiation measurements, solar energy collector, Physical principle of the conversion of solar radiation into heat, solar cookers, solar distillation, solar furnaces, solar greenhouses, solar electric power generation

MODULE 2 (6 hours)

Basic principle of wind energy conversion, basic components of wind energy conversion system, wind energy collectors. application of wind energy.

MODULE 3 (8 hours)

Geothermal sources, advantages and disadvantages of geothermal energy over other energy forms, application of geothermal energy. Biomass energy, Method of obtaining energy from biomass.



**THUNCHAN MEMORIAL GOVT. COLLEGE, TIRUR**  
**DEPARTMENT OF PHYSICS**

**ADD ON COURSE (TMGCPHY AC2)**

**ENERGY HARVESTING FROM RENEWABLE RESOURCES**

**Course objectives:**

To provide an overview of the important renewable energy resources and harnessing technologies. Nowadays the energy requirement of the society is high but the conventional sources of energy is not enough for it. So this course is intended for first year BSc Physics students to understand the importance of non-conventional energy sources.

**Duration of the course : 30 Hours**

**Total Credits : 4**

**TOTAL MODULES: 4**

**TOTAL HOURS :30**

**MODULE 1 ( 8 HOURS)**

Solar constants, Solar radiation measurements, solar energy collector, Physical principle of the conversion of solar radiation into heat, solar cookers, solar distillation, solar furnaces, solar greenhouses, solar electric power generation

**MODULE 2 (6 hours)**

Basic principle of wind energy conversion, basic components of wind energy conversion system, wind energy collectors. application of wind energy.

**MODULE 3 (8 hours)**

Geothermal sources, advantages and disadvantages of geothermal energy over other energy forms, application of geothermal energy. Biomass energy, Method of obtaining energy from biomass.



MODULE 4 (8 hours)

Ocean thermal electric conversion. Energy from tides. Basic principle of tidal power. advantages and limitations of tidal power generation. advantages and disadvantages of wave energy wave energy conversion devices. Advantages of battery for bulk energy storage

References:

1. Non- Conventional Energy Sources and Utilisation by R.K.Rajput, S.Chand Publishers
2. Non-Conventional Energy Resources by G. D. Rai, Khanna Publishers, 2008.
3. Solar Energy Fundamentals and application by H.P. Garg and J. Prakash, Tata McGraw- Hill Publishing company Ltd. 1997.
4. Solar Energy by S. P. Sukhatme, Tata McGraw- Hill Publishing company ltd, 1997.



A handwritten signature in black ink, appearing to read "Aboothahir Afzal".

ABOOTHAHIR AFZAL  
ASST. PROFESSOR IN PHYSICS  
T.M. GOVT. COLLEGE VAKKAD P.O.  
TIRUR, KERALA - 676502









THUNCHAN MEMORIAL GOVT. COLLEGE TIRUR  
DEPARTMENT OF PHYSICS

ENERGY HARVESTING FROM RENEWABLE RESOURCES

REPORT

Department of Physics of Thunchan Memorial Govt. College Tirur conducted an Add-on course "Energy harvesting from Renewable Resources" with 30 hours duration in the academic year 2019-2020. Thirty five students were enrolled in the course. Mrs. SOUMYA C was appointed as Course Coordinator. All the 35 students completed the course successfully.

  
Co-ordinator

  
Head of the department

ABOOTHAHIR AFZAL  
ASST. PROFESSOR IN PHYSICS  
T.M. GOVT. COLLEGE VAKKAD P.O.  
TIRUR, KERALA - 676502



**T M GOVT COLLEGE TIRUR****DEPARTMENT OF PHYSICS****ENERGY HARVESTING FROM RENEWABLE RESOURCES(TMGCPHY AC2)****MARK LIST OF STUDENTS COMPLETED THE COURSE(2019-2020)**

SL NO	NAME	MARKS/ GRADE
1	ABHITHA F	A
2	ADARSH K	A
3	ANAI MATHE W	A
4	DAWIN ALDO DAISON	A
5	GOKUL K P	B
6	MIDHUN T	A
7	MILHAB A	A
8	MOHAMED SIBIL P P	B
9	MOHAMMED MIDULAJ K	A
10	MOHAMMED SALIM N K	B
11	MUHAMED MARSHAD	A
12	MUHAMMED ANAS K	A
13	MUHAMMED SAFWAN	A
14	NIBIL MUHAMMED N V	A
15	SHIBINLAL K K	A
16	SHIJIL K T	A
17	ADITHYA P V	A
18	AJMAL M P	A
19	AMRUTHA HARIDAS	A
20	ANARGHA C P	A
21	ANJITHA PRABHAKARAN E K	A
22	BHAVANA C	A
23	DEVIKA A V	A
24	GADHA C	A
25	JINEESA P P	A
26	KEERTHANA V	B
27	LIBA MARIYAM K	A
28	MOHAMMED AMEEN V V	A
29	NAJIYA NAZRIN V	A
30	NANDANA M	A
31	NUBAINA V V	A
32	SHAFNA ALPARAMBIL	A
33	SHONIMA A	A
34	SREELAKSHMI V P	A
35	VINAYAK I	A

COURSE COORDINATOR


H.O.D



ABOOTHAMIR AFZAL  
ASST. PROFESSOR IN PHYSICS  
T.M. GOVT. COLLEGE VAKKAD P.O.,  
TIRUR, KERALA - 676602

**T M GOVT COLLEGE TIRUR**  
**DEPARTMENT OF PHYSICS**  
**ENERGY HARVESTING FROM RENEWABLE RESOURCES(TMGCPHY AC2)**  
**LIST OF STUDENTS COMPLETED THE COURSE(2019-2020)**

SL.NO	NAME	CLASS
1	ABHIJITH C	COMPLETED
2	ADARSH A	COMPLETED
3	ANAT MATHEW	COMPLETED
4	DALWIN ALDO DAISON	COMPLETED
5	GOKUL K P	COMPLETED
6	MIDHUN T	COMPLETED
7	MISHAB A	COMPLETED
8	MOHAMED SIBILI P P	COMPLETED
9	MOHAMMED MIDULAJ K	COMPLETED
10	MOHAMMED SALIM N K	COMPLETED
11	MUHAMED MARSHAD	COMPLETED
12	MUHAMMED ANAS K	COMPLETED
13	MUHAMMED SAFWAN	COMPLETED
14	NIBIL MUHAMMED N V	COMPLETED
15	SHIBINLAL K K	COMPLETED
16	SHIJIL K T	COMPLETED
17	ADITHYA P V	COMPLETED
18	AJMAL M P	COMPLETED
19	AMRUTHA HARIDAS	COMPLETED
20	ANARGHA C P	COMPLETED
21	ANJITHA PRABHAKARAN E K	COMPLETED
22	BHAVANA C	COMPLETED
23	DEVIKA A V	COMPLETED
24	GADHA C	COMPLETED
25	JINEESA P P	COMPLETED
26	KEERTHANA V	COMPLETED
27	LIBA MARIYAM K	COMPLETED
28	MOHAMMED AMEEN V V	COMPLETED
29	NAJIYA NAZRIN V	COMPLETED
30	NANDANA M	COMPLETED
31	NUBAINA V V	COMPLETED
32	SHAFNA ALPARAMBIL	COMPLETED
33	SHONIMA A	COMPLETED
34	SREELAKSHMI V P	COMPLETED
35	VINAYAK P	COMPLETED

  
**COURSE COORDINATOR**

  
**HOD**



**ABOOTHAHIR AFZAL**  
 SST, PROFESSOR IN PHYSICS  
 M. GOVT. COLLEGE YAKKAD P.O.  
 TIRUR, KERALA - 676502

**T M GOVT COLLEGE TIRUR**  
**DEPARTMENT OF PHYSICS**  
**ENERGY HARVESTING FROM RENEWABLE RESOURCES**  
**LIST OF STUDENTS ENROLLED (2019-2020)**

SL.NO	Ad.No	NAME	CLASS
1	9164	ABHIJITH C	I BSc PHYSICS
2	9373	ADARSH A	I BSc PHYSICS
3	9162	ANAT MATHEW	I BSc PHYSICS
4	9124	DALWIN ALDO DAISON	I BSc PHYSICS
5	9100	GOKUL K P	I BSc PHYSICS
6	9027	MIDHUN T	I BSc PHYSICS
7	9369	MISHAB A	I BSc PHYSICS
8	9208	MOHAMED SIBILI P P	I BSc PHYSICS
9	9302	MOHAMMED MIDULAJ K	I BSc PHYSICS
10	9215	MOHAMMED SALIM N K	I BSc PHYSICS
11	9297	MUHAMED MARSHAD	I BSc PHYSICS
12	9128	MUHAMMED ANAS K	I BSc PHYSICS
13	9279	MUHAMMED SAFWAN	I BSc PHYSICS
14	9312	NIBIL MUHAMMED N V	I BSc PHYSICS
15	9319	SHIBINLAL K K	I BSc PHYSICS
16	9292	SHIJIL K T	I BSc PHYSICS
17	9324	ADITHYA P V	I BSc PHYSICS
18	9275	AJMAL M P	I BSc PHYSICS
19	9115	AMRUTHA HARIDAS	I BSc PHYSICS
20	9147	ANARGHA C P	I BSc PHYSICS
21	9140	ANJITHA PRABHAKARAN E K	I BSc PHYSICS
22	9256	BHAVANA C	I BSc PHYSICS
23	9139	DEVIKA A V	I BSc PHYSICS
24	9260	GADHA C	I BSc PHYSICS
25	9141	JINEESA P P	I BSc PHYSICS
26	9285	KEERTHANA V	I BSc PHYSICS
27	9199	LIBA MARIYAM K	I BSc PHYSICS
28	9361	MOHAMMED AMEEN V V	I BSc PHYSICS
29	9323	NAJIYA NAZRIN V	I BSc PHYSICS
30	9364	NANDANA M	I BSc PHYSICS
31	9349	NUBAINA V V	I BSc PHYSICS
32	9259	SHAFNA ALPARAMBIL	I BSc PHYSICS
33	9316	SHONIMA A	I BSc PHYSICS
34	9181	SREELAKSHMI V P	I BSc PHYSICS
35	9095	VINAYAK P	I BSc PHYSICS

COURSE COORDINATOR



HOD

ABOOTHAHIR AFZAL  
 ASST. PROFESSOR IN PHYSICS  
 T.M. GOVT. COLLEGE TIRUR, KANNUR DISTRICT  
 PIN - 690 002



**THUNCHAN MEMORIAL  
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## *Certificate*

*It is certified by duly appointed examiners that*

***ABHIJITH C***

*9164, First BSc Physics  
has qualified*

***Energy harvesting from renewable resources***

*offered by the*

***the Department of Physics***

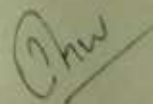
*He / She has been placed in A Grade  
for the examination held in*

***March 2020***

Given under the Seal of the College.

for 

Head of the Department



Principal



**Syllabus of Add-on Course in**

**Characterization Techniques in Materials  
Science**

**for**

**Third year BSc Physics**



**Thunchan Memorial Govt. College, Tirur**

**Vakkad PO, Malappuram**

**T M GOVT COLLEGE TIRUR**

**DEPARTMENT OF PHYSICS**

**ADD-ON COURSE ON CHARACTERIZATION TECHNIQUES IN  
MATERIALS SCIENCE**

**Course aims**

By the end of the course students will be expected to:

- The objective of the course is to provide a broad overview about different techniques available for structural characterization of various materials systems.
- Familiarise the imaging of the microstructure by various microscopy
- Their importance in materials research and application to real problem will be emphasised
- Crystal Structures, Mechanical Properties of Metals, Nano materials, dielectric materials

**Duration of the course** : 30 Hours  
**Total Credits** : 4

**SYLLABUS**

**Unit 1**

**3 Hrs**

**Introduction**

What is material science, Classification of materials-metals, ceramics, polymers, composites, Advanced materials, smart materials.

**Unit 2**

**9 Hrs**

**Structural characterization Techniques**

XRD, Single crystal and powder diffraction techniques with diffractometer, Laue's technique and rotating crystal method

**Unit 3**

**13 Hrs**

**Microscopic techniques**



Optical microscopy, Basic concepts of electron microscopy, electron gun, electromagnetic lens, Resolution, Transmission electron microscopy, scanning electron microscopy, Scanning probe microscopy

**Unit 4**

**5 Hrs**

**Spectroscopic Techniques**

UV-Visible Spectroscopy, PL Spectroscopy, FTIR Spectroscopy

**Book for study**

1. Encyclopedia of Materials Characterization- Surfaces, Interfaces, Thin Films by C. Richard Brundle, Charles A Evans Jr., Shaun Wilson

**Book for reference**

1. Materials science and engineering- Vth Edn- V Raghavan( PHI)
2. Material science by S.L.Kakani & Amit Kakani, 2nd edition 2010, reprint 2011
3. Material Science & Engineering, R.K. Rajput (Jain Book Agency)
4. Material Science and Engineering, I. P. Singh, & Subhash Chander (Jain Book Agency)
5. Christopher Toumey, Reading Feynman Into Nanotechnology: A Text for a New Science, Techné 12:3 Fall 2008.
6. Pulikel M. Ajayan, Nanocomposite Science and Technology, Wiley-VCH, 2005.
7. H. S. Nalwa (Ed.), "Encyclopedia of Nanoscience & Nanotechnology", American Scientific Publishers, California, 2004.



**ABOOTHAHIR AFZAL**  
ASST. PROFESSOR IN PHYSICS  
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**THUNCHAN MEMORIAL GOVT. COLLEGE TIRUR**  
**DEPARTMENT OF PHYSICS**  
**ADD ON COURSE ON CHARACTERIZATION TECHNIQUES IN MATERIAL SCIENCE**  
**MARK LIST OF STUDENTS COMPLETED THE COURSE(2019-2020)**


SL.NO	REG.NO	NAME	MARKS/GRADE
1	TMARSPH001	AMINA	A
2	TMARSPH002	FAHMIDA SHIRIL V P	A
3	TMARSPH003	HARSHITHA K K	A
4	TMARSPH004	MINSHAD P P	A
5	TMARSPH005	MOHAMMED JASIR N	A
6	TMARSPH006	MOHAMMED SHAMNAD K M	A
7	TMARSPH007	MUHSINA K K	A
8	TMARSPH008	SHADIYA N V	A
9	TMARSPH009	ABI FELIX B S	A
10	TMARSPH010	AMEEKHA HUSSAIN	A
11	TMARSPH011	ANUPAMA K V	A
12	TMARSPH012	AYISHA YASMIN K T	A
13	TMARSPH013	BASIRA NASRI V K	A
14	TMARSPH014	DHANUSREE M K	A
15	TMARSPH015	MANU M SREENIVAS	A
16	TMARSPH016	REHNA K	A
17	TMARSPH017	SARANYA K V	A
18	TMARSPH018	SAYANA K	A
19	TMARSPH019	SINDHOORA P	A
20	TMARSPH020	ABHIRAM M	A
21	TMARSPH021	ADITHYA M V	A
22	TMARSPH022	AHALYA P	A
23	TMARSPH023	AJAY C K	A
24	TMARSPH024	ANSILA P N	B
25	TMARSPH025	ANUPAMA M	A
26	TMARSPH026	ARUN T K	A
27	TMARSPH030	GOPIKA M P	A



28	TMARSPH031	HIRANDAS P P	A
29	TMARSPH032	INDU M V	A
30	TMARSPH033	JITHESH P	B
31	TMARSPH034	NEERAJA T P	A
32	TMARSPH035	NEETHU C	A
33	TMARSPH036	RAHULKUMAR M P	A
34	TMARSPH037	RANJUSHA K	A
35	TMARSPH038	RAVEENA P	B
36	TMARSPH039	ROSHNI P	A
37	TMARSPH040	SARANNYA SANKAR C T	A
38	TMARSPH041	SUDHIN C V	A
39	TMARSPH042	NAJAH K T	A
40	TMARSPH044	ASWATHY N K	B
41	TMARSPH043	ARDRA RAMAKRISHNAN	A
42	TMARSPH045	FATHIMATH SHERMILY C	

  
COURSE COORDINATOR



  
HOB  
**ABOOTHAHIR AFZAL**  
ASST. PROFESSOR IN PHYSICS  
T.M. GOVT. COLLEGE VAKKAD P.O.  
TIRUR, KERALA - 676502

T.M. GOVT COLLEGE TIRUR  
DEPARTMENT OF PHYSICS

ADD ON COURSE ON CHARACTERIZATION TECHNIQUES IN  
MATERIAL SCIENCE

REPORT

Department of Physics of Thunchan Memorial Govt. College Tirur conducted an add-on course on "Characterization Techniques in Materials Science" with 30 hours duration in the academic year 2019-20. Forty Two students were enrolled in the course. Smt.Soumya C was appointed as Course Coordinator. All the 42 students completed the course successfully.

  
COURSE COORDINATOR



  
H.O.D.



THUNCHAN MEMORIAL GOVT. COLLEGE TIRUR

DEPARTMENT OF PHYSICS

ADD ON COURSE ON CHARACTERIZATION TECHNIQUES IN MATERIAL SCIENCE

LIST OF STUDENTS ENROLLED IN THE COURSE(2019-2020)

SL.NO	REG. NO	NAME	CLASS
1	TMARSPH001	AMINA	III BSc PHYSICS
2	TMARSPH002	FAHMIDA SHIRIL V P	III BSc PHYSICS
3	TMARSPH003	HARSHITHA K K	III BSc PHYSICS
4	TMARSPH004	MINSHAD P P	III BSc PHYSICS
5	TMARSPH005	MOHAMMED JASIR N	III BSc PHYSICS
6	TMARSPH006	MOHAMMED SHAMNAD K M	III BSc PHYSICS
7	TMARSPH007	MUHSINA K K	III BSc PHYSICS
8	TMARSPH008	SHADIYA N V	III BSc PHYSICS
9	TMARSPH009	ABI FELIX B S	III BSc PHYSICS
10	TMARSPH010	AMEEKHA HUSSAIN	III BSc PHYSICS
11	TMARSPH011	ANUPAMA K V	III BSc PHYSICS
12	TMARSPH012	AYISHA YASMIN K T	III BSc PHYSICS
13	TMARSPH013	BASIRA NASRI V K	III BSc PHYSICS
14	TMARSPH014	DHANUSREE M K	III BSc PHYSICS
15	TMARSPH015	MANU M SREENIVAS	III BSc PHYSICS
16	TMARSPH016	REHNA K	III BSc PHYSICS
17	TMARSPH017	SARANYA K V	III BSc PHYSICS
18	TMARSPH018	SAYANA K	III BSc PHYSICS
19	TMARSPH019	SINDHOORA P	III BSc PHYSICS
20	TMARSPH020	ABHIRAM M	III BSc PHYSICS
21	TMARSPH021	ADITHYA M V	III BSc PHYSICS



22	TMARSPH022	AHALYA P	III BSc PHYSICS
23	TMARSPH023	AJAY C K	III BSc PHYSICS
24	TMARSPH024	ANSILA P N	III BSc PHYSICS
25	TMARSPH025	ANUPAMA M	III BSc PHYSICS
26	TMARSPH026	ARUN T K	III BSc PHYSICS
27	TMARSPH030	GOPIKA M P	III BSc PHYSICS
28	TMARSPH031	HIRANDAS P P	III BSc PHYSICS
29	TMARSPH032	INDU M V	III BSc PHYSICS
30	TMARSPH033	JITHESH P	III BSc PHYSICS
31	TMARSPH034	NEERAJA T P	III BSc PHYSICS
32	TMARSPH035	NEETHU C	III BSc PHYSICS
33	TMARSPH036	RAHULKUMAR M P	III BSc PHYSICS
34	TMARSPH037	RANJUSHA K	III BSc PHYSICS
35	TMARSPH038	RAVEENA P	III BSc PHYSICS
36	TMARSPH039	ROSHNI P	III BSc PHYSICS
37	TMARSPH040	SARANNYA SANKAR C T	III BSc PHYSICS
38	TMARSPH041	SUDHIN C V	III BSc PHYSICS
39	TMARSPH042	NAJAH K T	III BSc PHYSICS
40	TMARSPH044	ASWATHY N K	III BSc PHYSICS
41	TMARSPH043	ARDRA RAMAKRISHNAN	III BSc PHYSICS
42	TMARSPH045	FATHIMATH SHERMILY C	III BSc PHYSICS

COURSE COORDINATOR



H.O.D

ABOOTHAFIR AFZAL  
ASST. PROFESSOR IN PHYSICS  
T.M. GOVT. COLLEGE VAKKAD P.O.  
TIRUR, KERALA - 678502

**THUNCHAN MEMORIAL GOVT. COLLEGE TIRUR****DEPARTMENT OF PHYSICS****ADD ON COURSE ON CHARACTERIZATION TECHNIQUES IN MATERIAL SCIENCE****LIST OF STUDENTS COMPLETED THE COURSE(2019-2020)**

SL.NO	REG. NO	NAME	STATUS
1	TMARSPH001	AMINA	COMPLETED
2	TMARSPH002	FAHMIDA SHIRIL V P	COMPLETED
3	TMARSPH003	HARSHITHA K K	COMPLETED
4	TMARSPH004	MINSHAD P P	COMPLETED
5	TMARSPH005	MOHAMMED JASIR N	COMPLETED
6	TMARSPH006	MOHAMMED SHAMNAD K M	COMPLETED
7	TMARSPH007	MUHSINA K K	COMPLETED
8	TMARSPH008	SHADIYA N V	COMPLETED
9	TMARSPH009	ABI FELIX B S	COMPLETED
10	TMARSPH010	AMEEKHA HUSSAIN	COMPLETED
11	TMARSPH011	ANUPAMA K V	COMPLETED
12	TMARSPH012	AYISHA YASMIN K T	COMPLETED
13	TMARSPH013	BASIRA NASRI V K	COMPLETED
14	TMARSPH014	DHANUSREE M K	COMPLETED
15	TMARSPH015	MANU M SREENIVAS	COMPLETED
16	TMARSPH016	REHNA K	COMPLETED
17	TMARSPH017	SARANYA K V	COMPLETED
18	TMARSPH018	SAYANA K	COMPLETED
19	TMARSPH019	SINDHOORA P	COMPLETED
20	TMARSPH020	ABHIRAM M	COMPLETED
21	TMARSPH021	ADITHYA M V	COMPLETED



22	TMARSPH022	AHALYA P	COMPLETED
23	TMARSPH023	AJAY C K	COMPLETED
24	TMARSPH024	ANSILA P N	COMPLETED
25	TMARSPH025	ANUPAMA M	COMPLETED
26	TMARSPH026	ARUN T K	COMPLETED
27	TMARSPH030	GOPIKA M P	COMPLETED
28	TMARSPH031	HIRANDAS P P	COMPLETED
29	TMARSPH032	INDU M V	COMPLETED
30	TMARSPH033	JITHESH P	COMPLETED
31	TMARSPH034	NEERAJA T P	COMPLETED
32	TMARSPH035	NEETHU C	COMPLETED
33	TMARSPH036	RAHULKUMAR M P	COMPLETED
34	TMARSPH037	RANJUSHA K	COMPLETED
35	TMARSPH038	RAVEENA P	COMPLETED
36	TMARSPH039	ROSHNI P	COMPLETED
37	TMARSPH040	SARANNYA SANKAR C T	COMPLETED
38	TMARSPH041	SUDHIN C V	COMPLETED
39	TMARSPH042	NAJAH K T	COMPLETED
40	TMARSPH044	ASWATHY N K	COMPLETED
41	TMARSPH043	ARDRA RAMAKRISHNAN	COMPLETED
42	TMARSPH045	FATHIMATH SHERMILY C	COMPLETED

  
COURSE COORDINATOR



  
H.O.D.

**ABOOTHAHIR AFZAL**  
ASST. PROFESSOR IN PHYSICS  
T.M. GOVT. COLLEGE VAKKAD P.O.  
TIRUR, KERALA - 676302





**THUNCHAN MEMORIAL  
GOVERNMENT COLLEGE, TIRUR**  
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Email:tmgetirur@gmail.com, Website:www.tmgctirur.ac.in

## *Certificate*

*It is certified by duly appointed examiners that*

***AYISHA YASMIN K T***

*8494, Third BSc Physics  
has qualified*

***Characterization Techniques in Material Science***

*offered by the*

***the Department of Physics***

*He / She has been placed in A Grade  
for the examination held in*

***March 2020***

Given under the Seal of the College.

*[Signature]*  
for  
Head of the Department



*[Signature]*  
Principal

THUNCHAN MEMORIAL GOVT. COLLEGE TIRUR  
DEPARTMENT OF PHYSICS

Introduction to Scientific Computing

REPORT

Department of Computer Science and Physics of Thunchan Memorial Govt. College Tirur conducted an Add-on course "Introduction to Scientific Computing" with 30 hours duration in the academic year 2019-2020. Thirty six students were enrolled in the course. Mrs. Jayasree . K was appointed as Course Coordinator. All the 36 students completed the course successfully.

Co-ordinator 



Head of the department

ABOOTHAHIR AFZAL  
ASST. PROFESSOR IN PHYSICS  
T.M. GOVT. COLLEGE VAKKAD P.O,  
TIRUR, KERALA - 676502

**THUNCHAN MEMORIAL GOVT. COLLEGE TIRUR**  
**DEPARTMENT OF PHYSICS**  
**ADD-ON COURSE ON INTRODUCTION TO SCIENTIFIC COMPUTING**  
**ENROLLED LIST OF STUDENTS (2019-2020)**

<b>SL.NO</b>	<b>REG.NO</b>	<b>NAME</b>	<b>CLASS</b>
1	TMASSPH001	HUSNA SHIREEN P K	II BSc PHYSICS
2	TMASSPH002	JAFSINA A P	II BSc PHYSICS
3	TMASSPH003	MUFEEDA K	II BSc PHYSICS
4	TMASSPH004	SHABEEBA THASNI M	II BSc PHYSICS
5	TMASSPH005	AFSAL RAFEEQ C	II BSc PHYSICS
6	TMASSPH006	ASHIQU AMEEN C H	II BSc PHYSICS
7	TMASSPH007	SAJEEL P	II BSc PHYSICS
8	TMASSPH008	SIRAJUDHEEN U	II BSc PHYSICS
9	TMASSPH009	C S JAYALAKSHMI	II BSc PHYSICS
10	TMASSPH010	KRISHNAPRIYA K	II BSc PHYSICS
11	TMASSPH011	SARANYA K	II BSc PHYSICS
12	TMASSPH012	AMEENU RAHMAN K	II BSc PHYSICS
13	TMASSPH013	KIRAN M R	II BSc PHYSICS
14	TMASSPH014	SHIBIN K	II BSc PHYSICS
15	TMASSPH015	AFSEENA P	II BSc PHYSICS
16	TMASSPH016	ANJANA E	II BSc PHYSICS
17	TMASSPH017	ARYA K P	II BSc PHYSICS
18	TMASSPH018	ATHULYA O	II BSc PHYSICS
19	TMASSPH019	ATHULYA RAMESH	II BSc PHYSICS
20	TMASSPH020	DRISYA DAS V	II BSc PHYSICS
21	TMASSPH021	JASNA THASNI K P	II BSc PHYSICS
22	TMASSPH022	JYOTHIKA C T	II BSc PHYSICS
23	TMASSPH023	MAHIMA T	II BSc PHYSICS
24	TMASSPH024	NAYAN JYOTHI C	II BSc PHYSICS
25	TMASSPH025	SAMEERA BANU V P	II BSc PHYSICS
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31	TMASSPH031	NIDHIN N P	II BSc PHYSICS
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33	TMASSPH033	SANAL M N	II BSc PHYSICS

34	TMASSPH034	SIDHARTH K V	II BSc PHYSICS
35	TMASSPH035	VISHNU K P	II BSc PHYSICS
36	TMASSPH036	RISANA THASNI	II BSc PHYSICS

COURSE COORDINATOR

  
Jayarajee K.

HOD

  
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**Prospectus and Syllabus of  
Add on Course in**

**Introduction to Scientific Computing  
for  
Second year BSc Physics**



**Thunchan Memorial Govt. College, Tirur**

Vakkad PO, Malappuram

**THUNCHAN MEMORIAL GOVT. COLLEGE TIRUR**  
**DEPARTMENT OF PHYSICS**

Introduction to Scientific Computing

**Prerequisites & Objectives**

**Prerequisites**

The students should have studied any basic computer language as a prerequisite for the course

**Course Objectives**

This course is intended for Second year BSc Physics students. In this course students are introduced to use Python as a tool to solve Physics problems. The emphasis is to learn using a high level programming language without actually going through the logic behind the equations that are to be coded. A minimal understanding of the basic mathematics is assumed. This develops familiarity and equips them to code a large number of physics problems and learn how to obtain results and plots using the software

**Duration of the course** : 30 Hours

**Total Credits** : 5

**Unit 1**

**5 Hrs**

**introduction to Python Programming**

Features of Python, History of Python Programming Language, Comparison between C and Python, Thrust areas of Python in Physics, Writing and execution of Python programs, Integrated Development Environments, installation and use of python distributions

**Unit 2**

**8 Hrs**

**Fundamental programming with Python:**

Designing a Program, identifiers, keywords, operators, and expressions. Arithmetic, Logical and Assignment operators, Precedence, Data types: Basic data types: Strings and numbers, displaying an output, type conversion, basic string operations & methods, format specifiers

**Unit 3**

**7 Hrs**

**Control structures**

**Decision Structures:** if, If —else, if ...elif...else, nested if decision flow statements

**Repetition Structure:** condition controlled: while loop. Count controlled: for loop, sentinels, continue and break statements, try and except statements

**Unit 4**

**Functions & Files**

**5 Hrs**

Built in function, modules, void function, flow charting, hierarchy charts, Local variables and scope, passing an argument function, value returning functions, Random number

eration

files: introduction to file input and output

## Unit 5

### Scientific computing packages

5 Hrs

**Numpy:** -Array object, creating array, matrix, indexing, slicing, resizing, reshaping, arithmetic operations, functions, matrices and vector operations  
**Matplotlib:** basic plotting,  
**Scipy:** Linear algebra operations, equation solving.

### Text Books & References

#### Text Books


Mark Lutz, "Learning Python" O'Reilly Media, 2013

Core Python Programming -Dr Nageswara Rao, 2017, Dreamtech Press

Introduction to Computing and problem solving using Python -E Balagruswamy

#### References

1. Robert Johansson, "Numerical Python: Scientific Computing and Data Science Applications with Numpy, SciPy and Matplotlib" Apress, 2019.
2. Rubin H. Landu, Manuel J. Paez, and Cristian C.Bordeianu, "Computational Physics Problem solving with Python" – Third Edition, Wiley VCH, 2015.

  
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19	TMASSPH019	ATHULYA RAMESH	A
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34	TMASSPH034	SIDHARTH K V	A
35	TMASSPH035	VISHNU K P	B
36	TMASSPH036	RISANA THASNI	A

CO-ORDINATOR

H.O.D

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COURSE COORDINATOR

HOD

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GOVERNMENT COLLEGE, TIRUR**  
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## *Certificate*

*It is certified by duly appointed examiners that*

***AFSAL RAFEEQ C***

*8731, First BSc Physics  
has qualified*

***Introduction to Scientific Computing***

*offered by the*

***the Department of Physics***

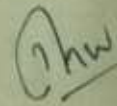
*He / She has been placed in A Grade  
for the examination held in*

***March 2020***

*Given under the Seal of the College.*

*for*  
  
Head of the Department



  
Principal

**Tirur: 31/03/2020**