



# **St. Michael's College, Cherthala**

**Alappuzha, Kerala-688 539**

**Affiliated to University of Kerala  
and Re-accredited by NAAC with 'A' Grade**



**ADD ON COURSE 2018-19**

**Name of the Programme : MATERIALS SCIENCE**

**Name of the Department : PHYSICS**

**Course Code : PY 089**



# St. Michael's College

**MAYITHARA P.O., CHERTHALA, ALAPPUZHA-688539**

An institution with Minority Status Affiliated to the University of Kerala and  
Re-accredited by NAAC with 'A' Grade

## Add on Course - 2018-19

**COMMERCE**

Diploma in Goods & Services  
Tax Practices (DGSTP) & Tally

**ZOOLOGY**

Vermi Technology

**CHEMISTRY**

Polymer Technology

**PHYSICS**

Materials science

**SOFTWARE  
DEVELOPMENT**

Android Development

**TOURISM  
STUDIES**

Customer Service Executive

**HINDI**

Hindi Language and Communication

**MATHEMATICS**

Basic Mathematics

**ENGLISH**

Basics of Business Communication



Phone : 0478-2822387, 2810387

Email : [michaelscherthala@gmail.com](mailto:michaelscherthala@gmail.com), Web : [www.stmc.ac.in](http://www.stmc.ac.in)

**NAME OF COURSE : MATERIALS SCIENCE**

**COURSE CODE : PY 089**

**NO OF STUDENTS ENROLLED : 30**

**CONTENTS**

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- **CLASS SCHEDULES**
- **ATTENDANCE STATEMENT**
- **QUESTION PAPER**
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# Materials Science

## Syllabus

### **(i) INTRODUCTION**

History, Fundamentals, Crystallography, Properties, Applications

### **(ii) SYNTHESIS**

Solid State route, Hydrothermal method, Slow evaporation in room temperature, Flux methods, Electro deposition, Sol-Gel method, Lithography, Co-precipitation method

### **(iii) CHARACTERIZATION**

X-Ray Diffraction (XRD), Raman Spectroscopy, Infra Red Spectroscopy, Scanning Electron Microscopy (SEM), Tunnelling Electron Microscopy (TEM), Atomic Force Microscopy (AFM), Auger Electron Spectroscopy (AES), UV-Visible Spectroscopy, Photoluminescence, Thermogravimetric analysis, Microwave analysis, Low frequency range analysis, Impedance spectroscopy

### **(iv) APPLICATIONS**

Materials for , Materials for ground transportation, Materials for aerospace, Materials for computers and communications, Materials for medicine

## MATERIALS SCIENCE

### *Time Table*

**Month : September Time 3.30 pm- 4.30 pm**

Date	Topic
19/09/2018	History of Materials Science
20/09/2018	Fundamentals
21/09/2018	Crystallography
24/09/2018	Properties

**Month : October Time 3.30 pm- 4.30 pm**

Date	Topic
01/10/2018	Applications
03/10/2018	Revision
04/10/2018	Introduction to the synthesis methods
05/09/2018	Solid state route
17/10/2018	Hydrothermal method
18/10/2018	Slow evaporation in room temperature
19/10/2018	Electro deposition, Sol-Gel method,
24/10/2018	Flux methods
25/10/2018	Lithography, Co-precipitation method

**Month : November Time 3.30 pm- 4.30 pm**

Date	Topic
07/11/2018	X-Ray Diffraction
08/11/2018	Raman Spectroscopy
09/11/2018	Raman Spectroscopy
14/11/2018	Infra Red Spectroscopy
15/11/2018	Scanning Electron Microscopy
16/11/2018	Tunnelling Electron Microscopy
21/11/2018	UV-Visible Spectroscopy
22/11/2018	Photoluminescence

**Month : December Time 3.30 pm- 4.30 pm**

Date	Topic
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12.	ANJALI S	X	x	x	x	x	x	x	x	x	X
13.	ANJU S	X	x	x	x	x	x	x	x	x	x
14.	ARYA B	X	x	x	x	a	a	x	x	x	x
15.	BHARATH PRAKASH MADHAV	X	x	x	x	x	x	x	x	x	x
16.	JAYAKRISHNAN H	X	x	x	x	x	x	x	x	x	x
17.	MIDHU M	X	x	x	x	x	x	x	x	x	x
18.	SNEHA SUDHI M	X	x	x	x	x	a	x	x	a	
19.	ASWATHI R	X	x	x	x	x	x	x	x	x	x
20.	INDHUJA S	X	x	x	x	x	x	x	x	x	x
21.	SALMAN SIRAJ	X	x	x	x	x	x	x	x	x	x
22.	SUNAINA SALIM	X	x	x	x	x	x	x	x	x	x
23.	DEVIKA S NATH	X	x	x	x	x	x	x	x	x	x
24.	NIMISHA NIKKADEMOSE	X	x	x	x	x	x	x	x	x	X
25.	SEBESTEENA XAVIER	X	x	x	x	x	x	x	x	x	x
26.	AMRUTHLAL	X	x	x	x	x	x	x	x	x	x
27.	DELEENA LINET ANTONY	X	x	x	a	a	x	x	x	a	x
28.	ANAKHA AJAY	X	x	x	x	x	x	x	x	x	x
29.	ATHIRA. S	X	x	x	x	x	x	x	x	x	x
30.	AYANA AJAY	X	x	x	x	x	x	x	x	x	x

#### Attendance

Sl No	Name of candidate	1	2	3	4	5	6	7	8	9	10
1.	AKSHARA S	A	X	a	x	x	x	x	a	x	x
2.	AMAL CYRUS	X	x	x	a	a	x	x	x	x	x
3.	AMALJITH V	A	x	x	x	x	x	x	a	x	x
4.	ANAGHA ANIL	X	x	x	x	x	x	x	x	x	x
5.	ASWATHY M A	X	x	x	x	x	x	x	x	x	x
6.	BHAGYASREE V	X	x	x	x	x	x	x	x	x	x
7.	MEKHA MOHAN	A	x	x	x	x	x	x	x	x	x
8.	SANJAY KRISHNA S BHAT	X	x	x	x	a	a	x	a	x	a
9.	SHARON OUSEPPACHAN	X	x	x	x	x	x	x	x	x	x
10.	SILPA ROY J	a	x	x	A	x	x	x	x	x	x
11.	ALEENA JOHNKUTTY	X	x	x	X	x	x	x	x	x	X
12.	ANJALI S	X	x	x	X	x	x	x	x	x	X
13.	ANJU S	X	x	x	X	x	x	x	x	x	x





	MADHAV										
16.	JAYAKRISHNAN H	X	x	x	x	x	x	x	x	x	x
17.	MIDHU M	X	x	x	x	x	x	x	x	x	x
18.	SNEHA SUDHI M	X	x	x	x	x	x	a	x	x	a
19.	ASWATHI R	a	x	x	x	x	x	x	x	x	a
20.	INDHUJA S	X	x	x	x	x	x	x	x	x	x
21.	SALMAN SIRAJ	X	x	x	x	x	x	x	x	x	x
22.	SUNAINA SALIM	X	x	x	x	x	x	x	x	x	x
23.	DEVIKA S NATH	X	x	x	x	x	x	x	x	x	x
24.	NIMISHA NIKKADEMOSE	X	x	x	x	x	a	x	x	x	X
25.	SEBESTEENA XAVIER	X	x	x	x	x	x	x	x	x	x
26.	AMRUTHLAL	X	x	x	x	x	x	x	x	x	x
27.	DELEENA LINET ANTONY	X	x	x	a	a	x	x	x	a	x
28.	ANAKHA AJAY	X	x	x	x	x	x	x	x	x	x
29.	ATHIRA. S	X	x	x	x	x	x	x	x	x	x
30.	AYANA AJAY	X	x	x	x	x	x	x	x	x	x

## St Michael's College, Cherthala

*Add on course Examination*

### Materials Science

March 2019

**Time: 1 hr**

**Total marks 25**

#### **Section A**

**(Answer *all* questions. Each question carries 1 mark)**

1. XRD is .....
2. Give the major categories of materials
3. What are the two classifications of Energy materials?
4. Differentiate between SEM and TEM
5. What are the properties of materials that should be possessed for aerospace applications?

## Section B

(Answer *all* questions. Each question carries 4 marks)

6. Explain conventional and advanced energy systems with examples
7. Write a short note on Radioactive waste
8. Explain the Solid State Ceramic route
9. Explain the principles of Raman and IR spectroscopy
10. Explain Cole- Cole Plots

Sl No	Candidate code	Name of candidate	Marks (25)	Remarks
1.	23016136001	AKSHARA S	22	Passed
2.	23016136002	AMAL CYRUS	19	Passed
3.	23016136003	AMALJITH V	21	Passed
4.	23016136004	ANAGHA ANIL	23	Passed
5.	23016136005	ASWATHY M A	21	Passed
6.	23016136006	BHAGYASREE V	25	Passed
7.	23016136010	MEKHA MOHAN	23	Passed
8.	23016136012	SANJAY KRISHNA S BHAT	18	Passed
9.	23016136013	SHARON OUSEPPACHAN	23	Passed
10.	23016136014	SILPA ROY J	23	Passed
11.	23016136015	ALEENA JOH NKUTTY	21	Passed
12.	23016136016	ANJALI S	23	Passed
13.	23016136017	ANJU S	20	Passed
14.	23016136020	ARYA B	18	Passed
15.	23016136022	BHARATH PRAKASH MADHAV	25	Passed
16.	23016136024	JAYAKRISHNAN H	24	Passed
17.	23016136026	MIDHU M	21	Passed
18.	23016136030	SNEHA SUDHI M	19	Passed
19.	23017136005	ASWATHI R	23	Passed
20.	23017136009	INDHUJA S	21	Passed
21.	23017136013	SALMAN SIRAJ	24	Passed

22.	<b>23017136016</b>	SUNAINA SALIM	24	Passed
23.	<b>23017136020</b>	DEVIKA S NATH	20	Passed
24.	<b>23017136026</b>	NIMISHA NIKKADEMOSE	21	Passed
25.	<b>23017136027</b>	SEBESTEENA XAVIER	22	Passed
26.	<b>23018136004</b>	AMRUTHLAL	21	Passed
27.	<b>23018136011</b>	DELEENA LINET ANTONY	18	Passed
28.	<b>23018136024</b>	ANAKHA AJAY	22	Passed
29	<b>23018136025</b>	ATHIRA. S	20	Passed
30.	<b>23018136026</b>	AYANA AJAY	22	Passed



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**CHERTHALA, ALAPPUZHA - 688 539**  
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## **ADD-ON COURSE CERTIFICATE**

*This is to certify that.....* **Miss. AKSHARA S (23016136001)**

*.....* **B.Sc Physics 2016 Admission**

*has completed Certificate/Add-on course in .....*

*.....* **Material Scicene (PY 089)**

*.....*  
*offered by the Department of Physics during the academic  
year 2018-2019. He/Shee is awarded with .....A.....*

**Head of the  
Department**

**Course  
Coordinator**

**Principal**

St Michael's College, Cherthala

Add on course on  
**Materials Science**  
Report

In order to make the students familiar with the new emerging research fields in Physics, an add on course was introduced on Materials Sciences for B.Sc Physics students in the academic year 2018- 2019. Through this course the students came to know about the basics of Materials Sciences and the characterization techniques. Some of the applications of advanced materials are also introduced to them.

29 students enrolled in this course and all of them successfully completed the course. An evaluation was conducted and all are given certificate of merit.



  
Principal  
St. Michael's College  
Cherthala