



# ST. ANN'S COLLEGE FOR WOMEN

(A Catholic Christian Minority Institution Affiliated to Acharya Nagarjuna University)  
(Recognized the College Under Section 2(f) of the UGC Act. 1956 - New Delhi)

AMARAVATHI ROAD, GORANTLA, GUNTUR - 522 034. A.P.

Date: 09-03-2023

## ADMISSION NOTICE

### ADD-ON CERTIFICATE COURSE : 2022 - 2023

The Department of Physics proposes to enroll new batch for Add-on Certificate course in "MATERIALS SCIENCE". This Program is for the students of III Year B.Sc – MPCs and MPC students of our college. The course will commence from 20<sup>th</sup> March, 2023. Details of the course are:

No. of Seats available : 35

Venue for Registration : Department of physics – Lab

Period of Course : 20<sup>th</sup> March, 2023 to 29<sup>th</sup> March, 2023

Duration of the Course : 36 Hours

Time : 9.00 am to 11.00 am and 1.00 pm to 3.00 pm

Mode of Teaching : Offline

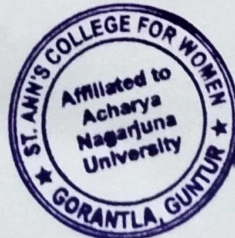
Course Co-ordinator(s) : Mr. Ch. Rama Rao.

Last date for Registration : 18<sup>th</sup> March, 2023.

→ A Minimum 80% attendance and 70% marks in Final assessment conducted by the Department are mandatory requirements for obtaining the certificate.

→ Admissions are done on the basis of First Come and First Serve and Fee is not refundable.

*Ch. Ravathi*  
Head of Dept. of Physics  
St. Ann's College for Women  
GORANTLA, GUNTUR-522034.



*Dr. S. Patilma Raju P*  
9/3/23  
PRINCIPAL  
St. Ann's College for Women  
GORANTLA, GUNTUR-522 034



## ADD-ON CERTIFICATE COURSE

Domain Subject : PHYSICS

Topic : " MATERIALS SCIENCE".

Number of Hours : 36

| Name of the Course        | Topic             | Theory Hours | Practical Hours | Total Number of Hours |
|---------------------------|-------------------|--------------|-----------------|-----------------------|
| Add-on Certificate Course | Materials Science | 30           | 6               | 36                    |

### Course Objectives:

To provide students a fundamental understanding of electrical, magnetic and optical properties of materials.

To apply those fundamentals for selecting and developing materials for different engineering applications.

### Learning Outcomes:

After learning this Add-on Certificate Course, the student will be able to...

1. Classify engineering materials and apply its knowledge to select suitable materials for specific applications.
2. Acquire a sound understanding of crystalline and non-crystalline structures through theoretical and practical sessions.
3. Analyse deformations behavior and strengthening mechanisms relying to this structure and properties of materials clearly.
4. Discuss the properties and the applications of non-ferrous metals and non- metallic materials.
5. Explain the mechanism and types of corrosion in metals and select the appropriate corrosion protection methods.



## SYLLABUS: -

Theory:

### UNIT-I:

(10 HRS)

**1. Materials and Crystal Bonding :** Materials ,classification, crystalline , Amorphous Glasses; Metals ,Alloys, Semi conductors, Polymers, Ceramics, Plastics, Bio-materials, Composites, Bulk and nanomaterials.

### UNIT-II:

(10 HRS)

**2. Defects and Diffusion in Materials:** Introduction- Types of defects-Point defects-Line defects-Surface defects-Volume defects-Production and removal of defects-Deformation- irradiation- quenching- annealing.

### UNIT- III:

(10 HRS)

**3. Magnetic Behaviour of Materials:** Different mechanical properties of engineering materials - Creep- Fracture – Technological properties – Factors affecting mechanical properties of a material. Magnetic materials-Dia, Para, Ferri and Ferro magnetic materials.Discussion of B-H curve.Hysterisis and energy loss.

### Practical/Lab :

1. Study the Hysteresis loop of a Ferroelectric crystal.
2. Study the B-H curve of 'Fe'using solenoid and determine the energy loss from hysteresis.

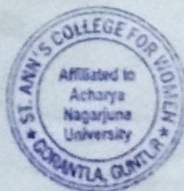
### Text Books:

1. Materials Science, Unified Physics.
2. Material Science and Engineering ,R.k.Rajput.

### References:

1. Materials Science by M. Armugam, Andhra Pradesh, 1990, Kumbakonam.
2. Materials Science and Engineering, V. Raghavan.

*C. Kanerla*  
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