NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

This course outline template acts as a guide for writing your course outline. As every course is different, please feel free to amend the template/ format to suit your requirements.

COURSE OUTLINE TEMPLATE			
Course Title	**MAGNETISM AND SUPERCONDUCTING LEVITATION**		
Course Code	**PH683**	**No. of Credits**	**3**
Department	**Physics**	**Faculty**	**Dr. R. Justin Joseyphus**
Pre-requisites Course Code	-		
Course Coordinator(s) (if, applicable)	**Dr. B. Karthikeyan**		
Other Course Teacher(s)/Tutor(s) E-mail	**rjustinj@nitt.edu**	**Telephone No.**	**2503614**
Course Type	☐ **Core course**	√ **Elective course**	

COURSE OVERVIEW

The course 'magnetism and superconducting levitation ' is offered to the M.Sc Physics students as an elective subject. The course offers topics on magnetism, magnetic materials, superconducting materials and and their applications in superconducting levitation.

COURSE OBJECTIVES

The objectives of the course is to

- Understand the magnetic behavior of superconducting materials.
- Learn the fundamentals of magnetism, superconductivity and materials used for superconducting levitation applications

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
1. Identify the magnetic and superconducting materials used in superconducting levitation 2. Understand the concept of magnetism and superconductivity 3. Classify the types of magnetic and superconducting materials 4. Apply basic concepts of magnetism and superconductivity in technology 5. Evaluate suitable materials and methods for superconducting levitation	➢ Obtain indepth knowledge on important Physics concepts ➢ Carry out independent research work in interdisciplinary areas ➢ Interact with professionals in related areas ➢ Communicate ideas and learn new technologies

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Mode of Delivery
	Total of 13 weeks – 40 h	5 Units	Lecture and flipped classroom
1.	First 2-3 weeks	Unit-I : Fundamentals of magnetism	Lectures and power point presentation.
2.	Next 2-3 weeks	Unit II: Types of magnetism	Lectures, Class room discussions and derivation by individual students.
3.	Three weeks	Unit-III: Magnetic phenomena	Lectures and power point presentation.
4.	Three weeks	Unit-IV: Superconducting materials	Lectures and discussions
5.	2-3 weeks	Unit-V: Superconducting levitation	Lectures, discussion on case studies

COURSE ASSESSMENT METHODS				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Quiz- I	On completion of Unit-I	30 min	10 %
2.	Group work	On completion of Unit-II	60-120 min	10 %
3.	Mid semester exam	On completion of Unit-III	60 min	20 %
4.	Quiz – II	On completion of Unit – IV	30 min	10 %
5.	Semester exam	As per regular timetable	180 min	50 %

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

Text Books

1.B. D. Cullity and C.D. Graham, Introduction to Magnetic Materials, Wiley, NJ, (2009).
2.C. Kittel, Introduction to Solid State Physics, 7th e
dition, Wiley (2006).
3.F. C. Moon, Superconducting Levitation, Wiley (2004).

Reference Books

1. S. Chikazumi, Physics of Ferromagnetism, Oxford University Press (1997).

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

- Performance in the assessment methods
- Questionnaire about the effectiveness of the delivery method, topics and the knowledge gained
- Evaluate the understanding of a research article on the particular topic by students.

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

- Attendance is not mandatory for the course. However long term absenteeism (50 % of each unit covered) should be avoided. Such students have to inform about the nature of the leave with proper documents. Those who are absent has to prepare a report of the topics covered by the teacher during their period of absence.

- Those who indulge in malpractice such as copying, plagiarism shall have to redo the course.

- Those who are absent during any of the assessment method on genuine grounds can undertake the assessment method once.

ADDITIONAL COURSE INFORMATION

The lecture materials such as notes, video lectures shall be displayed in NIT-T moodle. In case of difficulty, the web links shall be informed in the class. The topics for discussion shall be announced in the class and the student has to go through study materials/video lectures before coming to the class. The teacher can be contacted through phone or in person for clarifications by the student on a mutually convenient time.

FOR SENATE'S CONSIDERATION

Course Faculty R. Jothi Joseph 28/8/2018 CC-Chairperson Thilleyan

HOD N. Gopalakrishnan