



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

NATIONAL EDUCATION POLICY

GE FOR UG

| Subject Code | Category | Subject Name | Teaching and Evaluation Scheme | | | | | | | | |
|--------------|----------|---|--------------------------------|---------------|----------------------|-------------------------|----------------------|----|---|---|---------|
| | | | Theory | | | Practical | | Th | T | P | CREDITS |
| | | | End Sem University Exam | Two Term Exam | Teachers Assessment* | End Sem University Exam | Teachers Assessment* | | | | |
| GUPH201 | IDC | LASER: Principal, Properties and Applications | 60 | 20 | 20 | 00 | 00 | 3 | 0 | 0 | 3 |

| | |
|--------------------------|--|
| Course Objectives | <ol style="list-style-type: none"> To develop the interest among the students and to provide basic understanding of the principles of Laser. To develop the acquaintance with unique properties of laser and their origin along applications in day-to-day life. |
| Course Outcomes | <ol style="list-style-type: none"> Student will be able to understand basic principle and working of Laser, Student will be able to utilize unique properties of laser in their diverse field of profession. |

| | | |
|---------------------|-----------|--|
| Abbreviation | | Teacher Assessment (Theory) shall be based on following components: Quiz / Assignment/ Project / Participation in class (Given that no component shall be exceed 10 Marks). |
| Th | Theory | |
| T | Tutorial | |
| P | Practical | Teacher Assessment (Practical) shall be based on following components: Viva / File / Participation in Lab work (Given that no component shall be exceed 50% of Marks). |

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore

Chairperson
Faculty of Studies
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore

Controller of Examination
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore

Joint Registrar
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

PHUGE07: LASER: Principal, Properties and Applications

UNIT I: Principal of Laser

Introduction to Laser, History of Laser, Noble prizes conferred in the field of laser, Spontaneous and Stimulated Emission, Population Inversion, Pumping, Resonator.

UNIT II: Classification of Laser

Classification of laser, Techniques of pumping for different types of lasers, Pumping Schemes: two, three and four level. Contentious and Pulse lasers.

UNIT III: Properties of Laser

Unique Properties of Laser with their origin: High Intensity, High Brightness, High Coherence, High Monochromaticity, High Directionality, Polarizability, and ultra-short duration pulses.

UNIT IV: Applications of Lasers-I

Material Processing: Cutting, welding, drilling, Surface hardening etc, Laser in communication, Medical in Medicine, Pollution Detection, Online flow measurement, Creation and confinement of plasma.

UNIT V: Applications of Lasers-II

Enrichment of Uranium U^{235} , Target designation, LIDAR, Holography, Entertainment, Barcode reading, DVD and Blue Ray reading writing, etc.

REFERENCES

1. Optics By Ghatak, TMH
2. Engineering Physics- V. S. Yadava, TMH
3. Optics by Brijlal and Subhrainyan.
- 4 Optoelectronics an Introduction, J.Wilson & J.F.B.Hawkes, Prentice-Hall II Edition.
5. LASER theory and applications by A. K. Ghatak & Tyagarajan, 1984,
6. LASERSs and Electro Optics, Christopher C. Davis, Cambridge Univ. Press, 1996.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore

Chairperson
Faculty of Studies
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore

Controller of Examination
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore

Joint Registrar
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore