ShikshaVertex

# Genetic Engineering

## Master genetic engineering and shape the future

SOLO SPRINT

LIVE EDGE

CAREER EDGE

**Added Extra Credentials From Leaders Like IBM**

**(Give The Exam.Get Certified.Stand Out.)**

IBM SkillsBuild

#startupindia

Skill India
कौशल भारत - कुशल भारत

# About ShikshaVertex

## Shaping Skills. Elevating Careers

ShikshaVertex is a next-generation EdTech startup committed to transforming careers through powerful, practical upskilling. In an ever-evolving job market, we bridge the gap between academic knowledge and industry-ready skills.

Our mission is to empower students, job-seekers, and professionals with the tools they need to succeed — from foundational skills to advanced specializations in high-demand fields.

We believe that education is not just about learning — it's about evolving. With industry-aligned curriculum, expert mentorship, and outcome-driven training, ShikshaVertex is where ambition meets execution.

**Career-Focused Upskilling**

**Mentor Support**

**Industry-Relevant Curriculum**

**Flexible Learning**

**Hands-on Learning**

**Certification & Recognition**

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# Why ShikshaVertex is Different From Rest?

## Built Different: Our Unique Edge

### Outcome-Driven Learning

Every course is designed with clear career outcomes and job-readiness as the end goal.

### Industry-Curated Curriculum

Programs are co-created with industry professionals to stay aligned with current and future skill demands

### Soft Skills Integration

We don’t stop at technical skills — communication, leadership, and interview readiness are built in.

### Mentorship That Matters

Direct access to mentors who are real-world professionals, not just instructors.

### Real-World Projects

Learners build a portfolio of hands-on projects that showcase practical expertise.

### Placement Support

End-to-end job assistance, including resume building, mock interviews, and employer connections.

While many EdTech platforms offer courses, ShikshaVertex is built around outcomes. We don’t just teach — we transform.

Our programs are meticulously designed to go beyond theoretical knowledge and focus on practical, real-world skills that employers actually look for.

We blend cutting-edge curriculum with mentorship, hands-on learning, and career development, making sure every learner not only learns but levels up — personally and professionally. At ShikshaVertex, we believe in learning that leads to earning.

**Because your career deserves more than just a Certificate**

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# Our Top Recruiters

accenture · Google · Microsoft · ORACLE

Tech Mahindra · Deloitte. · TCS TATA CONSULTANCY SERVICES · amazon

fractaboo INTELLIGENCE FOR IMAGINATION · IBM. · HCL · BOSCH

## Explore Career Opportunities With Our

25+ Domains

Discover Your Career Path

Network with Industry Leaders

Build a Standout Portfolio

## Follow Us For Career-Changing Content!

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# Scope of Genetic Engineering

**7 Million**
jobs by 2025

**50,000 +**
Indian businesses are present on Linkedin

**610.5 $Million**
Industry in India by 2030

**77 % CFOs**
are set to spend more on Genetic Engineering

Genetic engineering transforms DNA to drive innovation in health, agriculture, and biotechnology
Join genetic engineering and become a future innovator.

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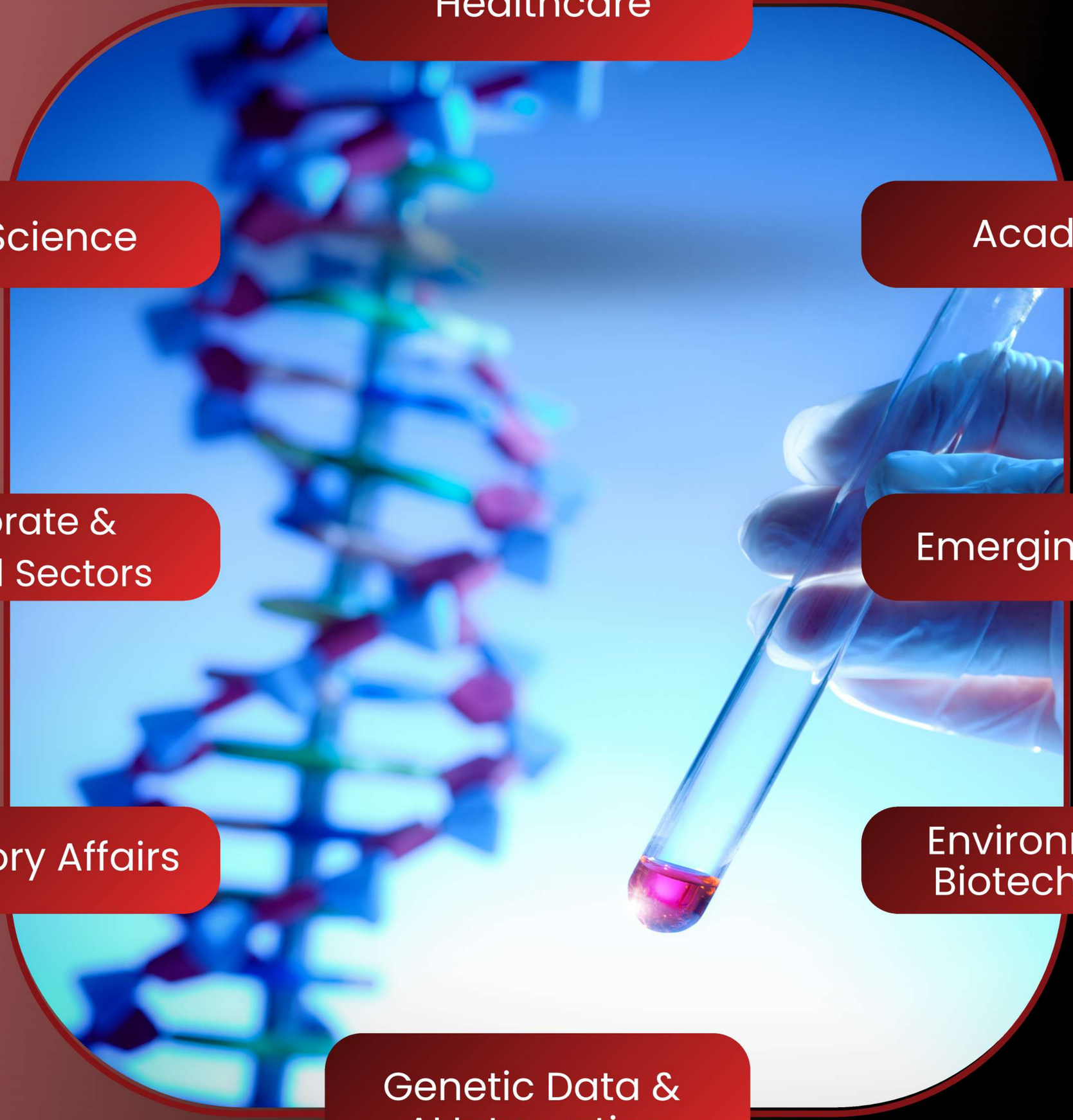
# Here is all the Career Fields you can Excel at



- Healthcare
- Food Science
- Academia
- Corporate & Applied Sectors
- Emerging Fields
- Regulatory Affairs
- Environmental Biotechnology
- Genetic Data & AI Integration

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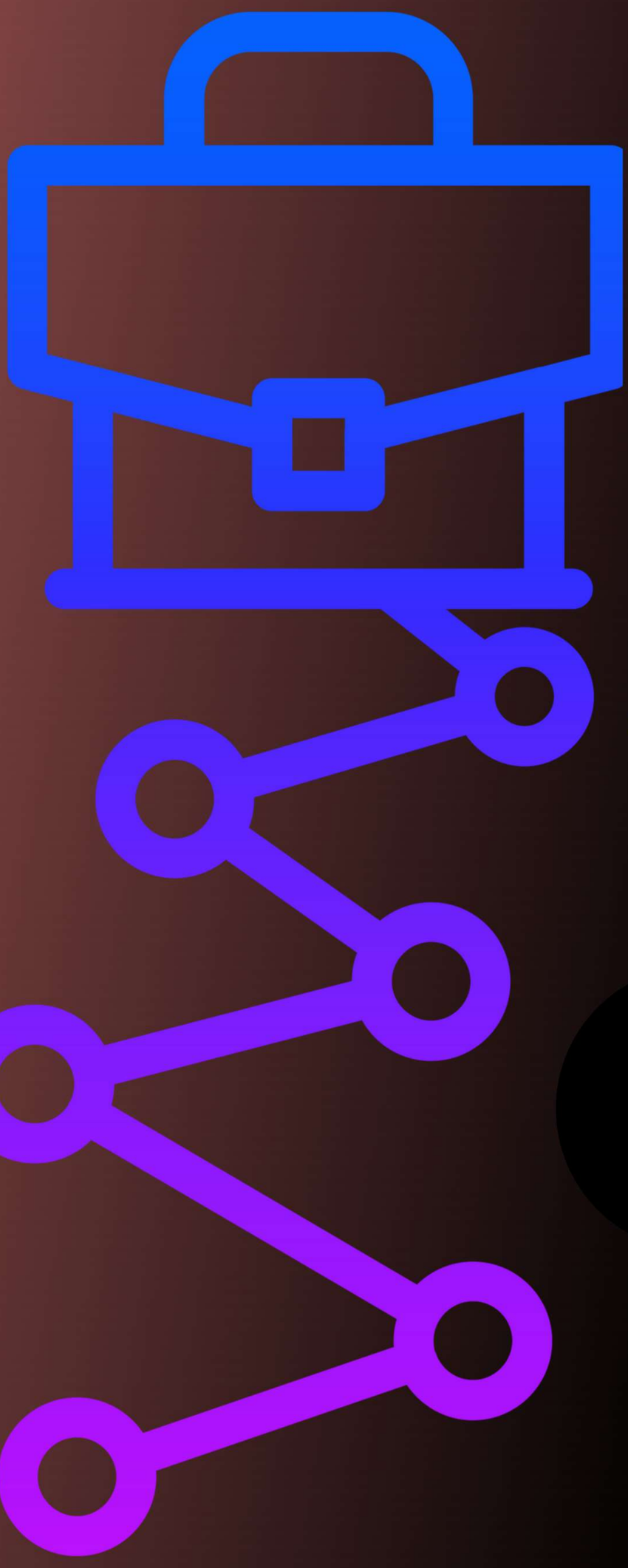
# Here is how your Career Trajectory will look like



**Principal Scientist**

CTC - 30 + LPA

**Senior Genetic Engineer**

CTC - 10-20 LPA

**Research Assistant**

CTC - 03-06 LPA

**Founder (Biotech Startup)**

CTC - 50+ LPA

**R&D Manager**

CTC -25 + LPA

**Genetic Engineer**

CTC - 06-10 LPA

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# 1 Chemistry of Nucleic Acids and Basics of Genetic Engineering

## Introduction to Nucleic Acids

- DNA and RNA as Genetic Material
- Structure and Properties of DNA and RNA
- Biological Significance of DNA and RNA Differences

## Primary Structure of DNA

- 3’,5’ Phosphodiester Bond
- Chemical and Structural Qualities
- Nucleotide Composition and Linkage

## Secondary Structure of DNA

- Watson & Crick Model of DNA
- Chargaff’s Rule
- X-ray Diffraction Analysis of DNA
- Forces Stabilizing DNA Structure (Hydrogen Bonds, Base Stacking)
- Conformational Variants of DNA (A-DNA, B-DNA, Z-DNA)

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Tertiary Structure of DNA

- ✓ DNA Supercoiling and Topology

## 2 Basics of Recombinant DNA Technology and DNA Libraries

### Manipulation of DNA

- ✓ Restriction Enzymes (Types and Mechanisms)
- ✓ Modification Enzymes (Methylation, Protection)
- ✓ Design of Linkers and Adaptors

### Cloning and Expression Vectors

- ✓ Plasmid-Based Vectors
- ✓ Bacteriophage-Based Vectors
- ✓ Vectors for Insect, Yeast, and Mammalian Systems

### Prokaryotic and Eukaryotic Host Systems

- ✓ Selection Methods for Recombinant DNA Introduction

### DNA Libraries

- ✔ Construction of Genomic and cDNA Libraries
- ✔ Artificial Chromosomes: BACs and YACs
- ✔ Chromosomal Walking Technique
- ✔ Screening of DNA Libraries using Nucleic Acid Probes and Antisera

## 3 DNA Sequencing, Amplification, and Site-Directed Mutagenesis

### DNA Sequencing Techniques

- ✔ Maxam-Gilbert and Sanger's Methods of DNA Sequencing
- ✔ Next-Generation Sequencing (NGS) Basics
- ✔ Real-World Applications of DNA Sequencing

### DNA Amplification Techniques (PCR)

- ✔ PCR Basics: Components and Mechanism
- ✔ Advanced PCR Techniques

### Site-Directed Mutagenesis

- ✔ Concept and Applications
- ✔ Techniques for Introducing Specific Mutations

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# 4 Nanotechnology – Synthesis, Characterization, and Applications

## Synthesis of Nanomaterials

- ✔ Soft Chemical Methods
- ✔ Organic and Inorganic Nanostructured Materials

## Fabrication of Nanomaterials

- ✔ Physical Methods
- ✔ Chemical Methods

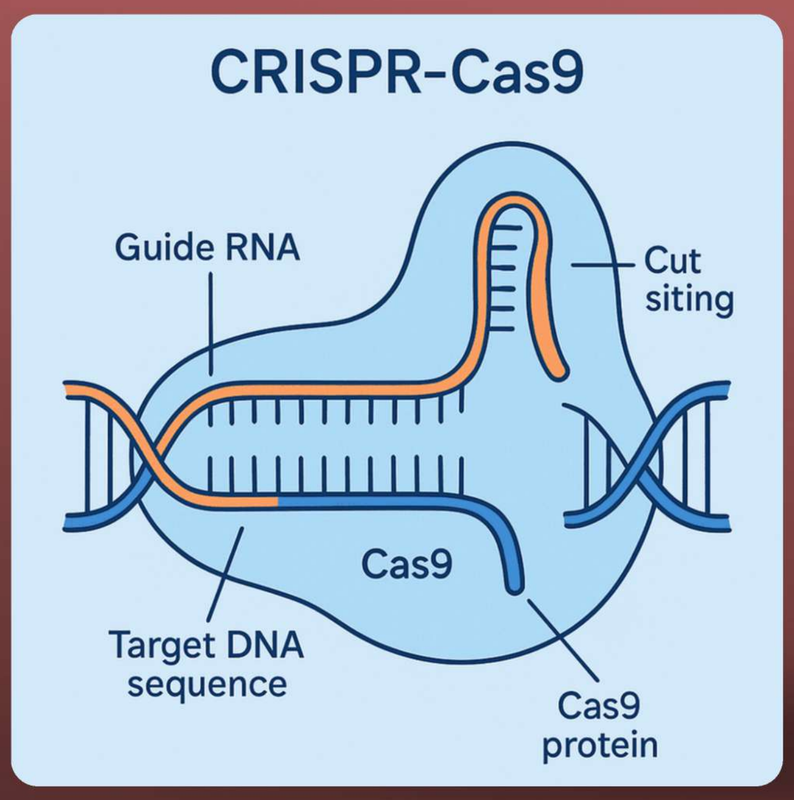
## Nanocomposites and Self-Organization

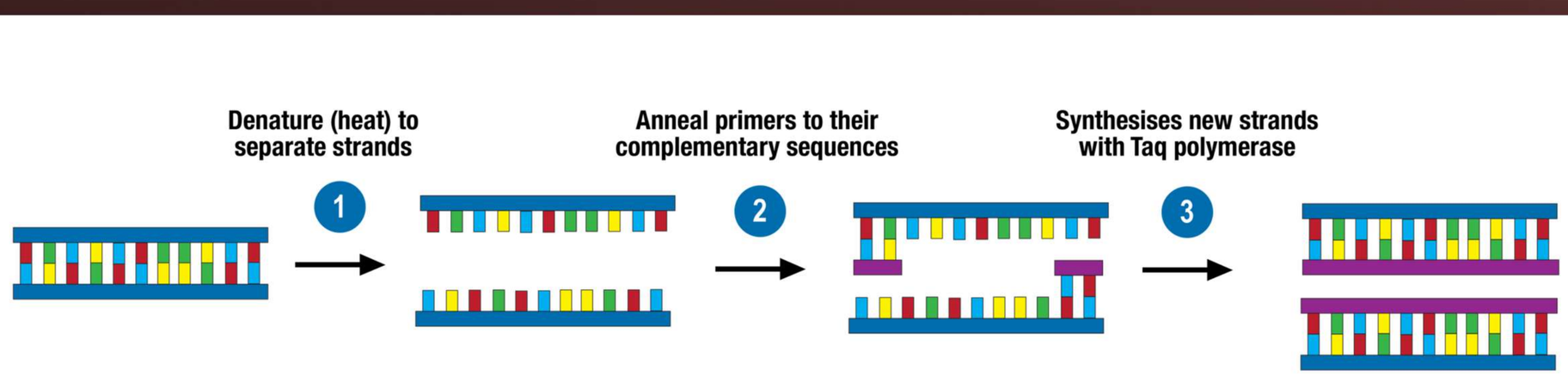
- ✔ Polymer Nanocomposites: Types and Applications
- ✔ Self-Organization of Nanostructures

## Nanotechnology for Biophotonics

- ✔ Interface of Bioscience, Nanotechnology, and Photonics
- ✔ Semiconductor Quantum Dots for Bioimaging
- ✔ Metallic Nanoparticles for Biosensing
- ✔ PEBBLE Nanosensors for In Vitro Bioanalysis
- ✔ Nanoclinics for Optical Diagnostics and Targeted Therapy

# Tools and Technologies you'll Learn



## Minor Projects :

| | |
|---|---|
| DNA Extraction and Analysis | Extract DNA from plant or animal cells (e.g., banana, onion, cheek cells). |
| PCR Amplification | Amplify a target gene (e.g., 16S rRNA or GFP). |
| Bioinformatcs -based Gene Analysis | Use NCBI or BLAST to identify gene sequences or predict protein function. |

## Major Projects :

| | |
|---|---|
| Gene editing tool | Use CRISPR-Cas9 to disable a specific gene in bacteria or yeast. |
| Plant Genetic Transformation | Introduce a foreign gene (e.g., drought-resistance gene) into plant tissues using Agrobacterium tumefaciens. |
| RNAi for Gene Silencing | Silence a target gene in plants, worms, or mammalian cells using siRNA or shRNA. |

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# Showcase your Learning Journey


Certificate of Completion from ShikshaVertex

Certificate of Internship from ShikshaVertex

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# CONTACT US

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