Adyapan School

# Genetic Engineering

**Duration - 2 months**

**Industry** Certification

Skill India Certified

**250+** Partner Companies

Adyapan School

# Transform genetic knowledge into breakthrough solutions.

From genes to engineered solutions - become industry-ready.

This immersive 8-week program builds comprehensive knowledge of genetic engineering from foundational genetics through cutting-edge genome editing technologies. Students progress from core molecular tools and cloning techniques through transgenic organisms, gene silencing, and CRISPR applications, culminating in a capstone project and an exploration of the ethical and regulatory landscape shaping the field's future.

| 8 | 30+ | 20,000+ |
|---|---|---|
| MODULES | PROGRAM OFFERINGS | STUDENTS |

250+ PARTNERED COMPANIES

AMGEN Biocon Dr.Reddy

adyapanschool.com

# Adyapan School

ABOUT ADYAPAN SCHOOLS

## Where education meets real-world impact

**Not just a course — a platform to launch your career.**

Adyapan Schools was built with a single conviction: learning works best when it happens in the real world. We partner with top companies, mentors, and industry platforms to ensure every student graduates with a portfolio of work that speaks louder than a certificate.

Our programs combine rigorous coursework with live client projects, giving you the skills and proof-of-work that employers actually want.

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### MISSION

To equip ambitious learners with practitioner-level digital marketing skills through mentor-led, project-based education that bridges the gap between learning and earning.

### VISION

To be India's most trusted launchpad for the next generation of marketing leaders — defined not by degrees but by the real work.

# Adyapan School

## Everything you need to grow fast

PROGRAM HIGHLIGHTS

### Live Industry Projects

Work on campaigns for real brands alongside your coursework. Build portfolio projects that prove your expertise to employers.

### 1-on-1 Mentorship

Dedicated mentors from Google, Microsoft, Mastercard and more. Get personalized guidance and industry connections.

### AI-Powered Marketing

Learn cutting-edge AI tools alongside evergreen fundamentals. Stay ahead of the curve in a rapidly evolving landscape.

### Dual Certification

Earn both a Course Completion and Internship Certificate — accredited by Skill India Digital Hub and NSDC.

### Internship Guarantee

Graduate with an internship completion certificate from a live brand project. Concrete, resume-ready proof of work.

### Industry Network

Join a network of alumni at Amazon, Google, Adobe, Microsoft. Access exclusive hiring events and referral opportunities.

# Adyapan School

CURRICULUM

# 8 weeks. 8 modules. Infinite impact.

WEEK 1

## Fundamentals of Genetics & Genetic Engineering

- Discussion of curriculum
- Introduction to genetic engineering: importance, tools, and applications;
- Mendelian and non-Mendelian inheritance
- Chromosomal inheritance: mitosis, meiosis, genetic recombination, and the molecular basis of mutation
- Tools and steps of genetic engineering: restriction endonucleases and their types, restriction modification systems, DNA ligases, and the core workflow from gene isolation to expression


WEEK 2

## Cloning Principles, Vectors & Genetic Libraries

- Principles and applications of molecular cloning: cutting and ligating DNA, selection of recombinant clones, blue-white screening, and antibiotic resistance markers
- Types of cloning vectors, their structure, capacity, and selection criteria for different cloning goals
- Artificial chromosomes and high-capacity vectors BAC, YAC, and MAC for large-insert cloning
- Genomic and cDNA library construction, library screening strategies, and DNA replication models: theta replication and rolling circle replication

WEEK 3

## Tools, Techniques & Sequence Analysis

- PCR and its applications: standard PCR, qPCR, RT-PCR, and gel electrophoresis for fragment visualization and sizing
- Blotting techniques, principles, sample preparation, and interpretation
- DNA sequencing methods: Sanger sequencing principles, next-generation sequencing (NGS) platforms, and an introduction to sequence alignment and annotation
- Microarrays and DNA footprinting: gene expression profiling using microarray technology, reporter gene systems, and their use in studying gene function and regulatory elements

CURRICULUM

# 8 weeks. 8 modules. Infinite impact.

WEEK 4

## Introduction of DNA into Host Cells

- Genetic manipulation of cells: transformation in bacteria, transfection types in eukaryotes, and selection of successfully modified cells
- Gene transfer methods: microinjection, lipofection, viral vectors, and biolistic particle delivery for plant transformation
- Agrobacterium-mediated plant transformation: Ti plasmid biology, T-DNA integration, and the production of transgenic plants
- Transgenic animal production: pronuclear microinjection, embryonic stem cell technology, somatic cell nuclear transfer, and the creation and validation of transgenic and knockout animal models

WEEK 5

## Gene Silencing & Regulation of Gene Expression

- Gene silencing mechanisms: transcriptional gene silencing through DNA methylation and chromatin remodeling
- RNA interference (RNAi) and the application of RNAi in functional genomics and therapeutic gene knockdown
- Knockout technology: homologous recombination-based knockout strategies, conditional knockouts
- Regulation of gene expression in prokaryotes and translation regulatory mechanisms in bacterial systems

WEEK 6

## Biopharmaceuticals, Gene Therapy & Transgenic Organisms

- Recombinant DNA technology in biopharmaceuticals: production of therapeutic proteins, vaccine antigens, and the role of microbial and mammalian expression systems
- Gene therapy concepts and clinical case studies
- Pharm animals and molecular farming
- Transgenic plants and sustainable agriculture: future trends in herbicide tolerance, drought resistance, biopharming, and the regulatory challenges surrounding GMO adoption

Adyapan School

CURRICULUM

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WEEK 7

## Genome Editing

- Genome editing overview
- Guide RNA design, Cas9 cleavage, DNA repair, HDR, and delivery strategies for different cell types
- Base editing and prime editing for precise single-nucleotide changes without double-strand breaks
- Case studies

WEEK 8

## Ethical, Legal & Societal Implications

- Bioethics, legal frameworks, and regulatory compliance
- Risk assessment and biosafety: containment principles for working with recombinant organisms, biosafety levels for genetic engineering laboratories, and global governance frameworks
- Future of genetic engineering, metagenomics, and environmental applications, and the societal implications of democratized genome editing
- Capstone project

# Adyapan School

WHO THIS IS FOR

## This course is perfect for

- Students & Career Switchers
- Aspiring Genetic Engineers & Molecular Biology Professionals
- Biotechnology, Microbiology & Biochemistry Students
- Researchers & Lab Professionals (Gene Editing & Recombinant DNA)
- Bioinformatics & Genomics Enthusiasts
- Healthcare, Agriculture & Biotech Innovation Aspirants

CERTIFICATIONS


ALUMNI NETWORK

## Our alumni work at world-class companies

Amazon | Adobe | Google | Autodesk | Microsoft | Deloitte

### Your career switch is one click away.

Ready to begin? Apply at adyapanschool.com or email us at support@adyapan.com

Apply Now