**Course: Advance Bio Informatics**

**Module Title: Genetic Engineering**

**Module No: 93**

**Genetic Engineering**

To create desired change is simple addition, deletion, or manipulation of a single trait in an organism. Also known recombinant DNA technology, means altering genes in living organism to produce new genotype.

Various kinds of genetic modification are possible:

* Inserting a foreign gene from one species into another.
* Altering an existing gene so that its product is changed.
* Changing gene expression so that it is translated more often or not at all.

**Selective Breeding:** Creating new breeds of animals & new crop plants

to improve our food.

**Cloning:** A clone produces two organisms with exactly the same genes. Plants are easily cloned by vegetative propagation; cuttings, layering, etc.

**Steps in GE**

1. Isolate the gene.
2. Insert it in a host using a vector.
3. Produce as many copies of the host as possible.
4. Separate and purify the product of the gene.

**Uses of GE**

It repairs a genetic defect. To enhance a natural effect e.g. growth.

It increases crop resistance to disease or climate. To test and screen for genetically inherited diseases. To cure disease by altering the genes. To select human genes embryo selection (designer babies).

**Pros and Cons**

**Crops**

* Better taste and quality
* Less time to ripen.
* More nutrients, more food, and stress tolerance.
* Improved resistance to disease, pests, and herbicides.
* New products and growing techniques.

**Animals**

* Increased resistance, productivity, hardiness, and feed efficiency.
* Better yields of meat, eggs, and milk.
* Improved animal health and diagnostic methods.

**Society**

* More food for growing populations.

**Ethics**

* Violation of natural organism’s intrinsic values.
* Tampering with nature by mixing genes among species.
* Objections to consuming animal genes in plants and vice versa.