RAMA UNIVERSITY

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FACULTY OF ENGINEERING & TECHNOLOGY

Dr. NIHARIKA SINGH
Assistant Professor
Dept. of Biotechnology

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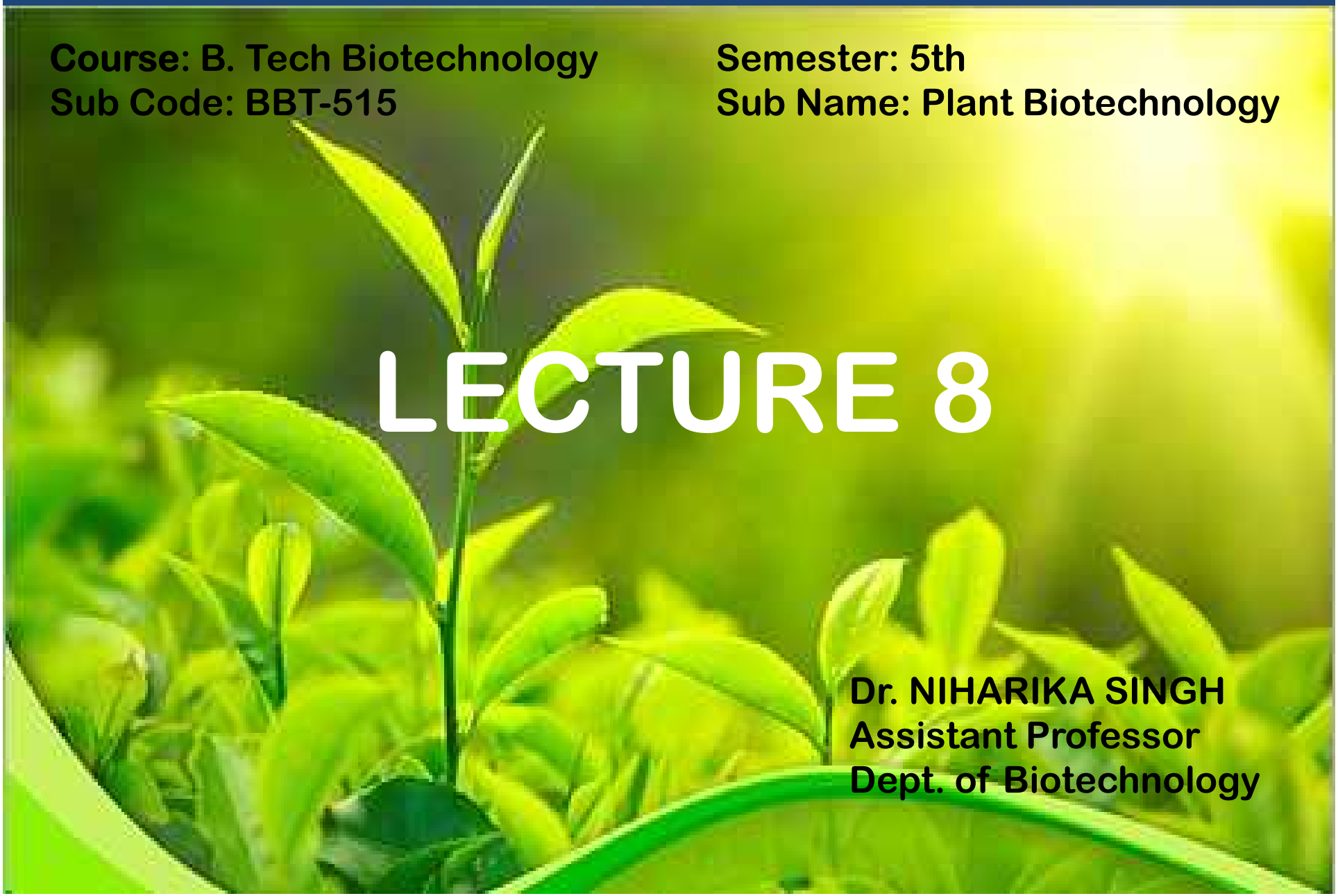
Sub Name: Plant Biotechnology



LECTURE 8

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ARTIFICIAL SEEDS

- Synthetic seeds are defined as **artificially encapsulated** somatic embryos, shoot buds, cell aggregates or any other tissue that can be used for sowing a seed and that possess the ability to convert into a plant under in vitro or ex vitro conditions and that retain this potential also after storage.

- Various plant species which are reported for artificial seed production are Carrot, Alfa alfa (somatic embryos), Banana, Cardamom (Shoot buds or shoot tips), Ecalyptus (Axillary buds) etc.

- They are classified as Desiccated and Hydrated. **These two are again classified into encapsulated and uncoated.**

- The **desiccated synthetic seeds** are produced from somatic embryos either naked or encapsulated in polyoxy ethylene glycol followed by their desiccation. E.g. Wheat, Soyabean (Uncoated), Carrot (Encapsulated)

- **Hydrated synthetic seeds** are produced in those plant species where somatic embryos are recalcitrant and sensitive to desiccation. Hydrated seeds are produced by encapsulating the somatic embryos or somatic propagules in hydrogel capsules. E.g. Carrot, tomato (Uncoated), Mango, Alfa alfa (Encapsulated)

Advantages of synthetic seeds

1. Stored up to a year without loss of viability

2. Easy to handle, and useful as units of delivery

3. Directly sown in the soil like natural seeds and do not need hardening in green house.

Applications of synthetic seeds

1. Micropropagation through artificial seeds.

2. For development of plants for breeding purpose

3. Propagation of variety of crop plants especially crops for which true seeds are not used or not readily available for multiplication or the true seeds are expensive. Hybrid plants may vegetatively propagated plants which are prone to infections e.g. Garlic, potato, tomato, hybrid rice etc.

4. Transplanting improved or selected material in forestry to reduce the cost of breeding e.g. European larch, white spruce etc.

5. Germplasm conservation of endangered species through cryopreservation of synseeds in near future.

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