Postgraduate Certificate in Biofabrication Fabrication

Biomaterials for Biofabrication

3D bioprinting: A type of additive manufacturing that uses biological materials, such as cells, growth factors, and biomaterials, to create complex living structures in a layer-by-layer manner.

* Related terms: Biofabrication, additive manufacturing, biomaterials
* Concept: 3D bioprinting is a promising technology for creating functional tissue and organ constructs for regenerative medicine, drug testing, and basic research.

Biofabrication: The use of engineering and life science principles to design, fabricate, and test biological structures and systems.

* Related terms: 3D bioprinting, additive manufacturing, biomaterials
* Concept: Biofabrication is a multidisciplinary field that combines principles from engineering, materials science, and biology to create functional living tissues and organs.

Biomaterials: Substances that are used to replace or augment natural tissues and organs in the body.

* Related terms: Scaffolds, hydrogels, biodegradable materials
* Concept: Biomaterials can be natural or synthetic and are used in a wide range of medical applications, including tissue engineering, drug delivery, and medical devices.

Cell-laden hydrogels: Hydrogels that contain living cells dispersed throughout the polymer network.

* Related terms: Hydrogels, 3D bioprinting, biomaterials
* Concept: Cell-laden hydrogels are used in 3D bioprinting to create living tissue constructs with controlled architecture and composition.

Decellularized extracellular matrix (dECM): The insoluble matrix that remains after the removal of cells from a tissue or organ.

* Related terms: Extracellular matrix, bioinks, scaffolds
* Concept: dECM is a natural biomaterial that can be used as a bioink for 3D bioprinting or as a scaffold for tissue engineering.

Extracellular matrix (ECM): The non-cellular component of tissues and organs that provides structural support and regulates cell behavior.

* Related terms: Decellularized extracellular matrix, biomaterials, scaffolds
* Concept: ECM is composed of proteins, polysaccharides, and other molecules that provide a microenvironment for cells and regulate their behavior.

Hydrogels: Crosslinked networks of hydrophilic polymers that can swell in water and maintain their

structure.

* Related terms: Cell-laden hydrogels, bioinks, biomaterials
* Concept: Hydrogels are used in 3D bioprinting as bioinks to create living tissue constructs with controlled architecture and composition.

Scaffolds: Porous structures that provide a framework for cells to attach, grow, and differentiate.

* Related terms: Biomaterials, extracellular matrix, tissue engineering
* Concept: Scaffolds can be made of natural or synthetic materials and are used in tissue engineering to create functional tissue constructs.

Tissue engineering: The use of engineering and life science principles to design, fabricate, and test biological substitutes that restore, maintain, or improve tissue function.

* Related terms: Biofabrication, biomaterials, scaffolds
* Concept: Tissue engineering is a multidisciplinary field that combines principles from engineering, materials science, and biology to create functional living tissues and organs.

Please note that the above glossary terms are only a part of the comprehensive glossary for the Postgraduate Certificate in Biofabrication and Fabrication. It is important to note that the length of individual glossary terms may vary, and some terms may be longer than others. Additionally, some terms may have more related terms or concepts than others. The goal is to provide clear, concise explanations of each term, along with practical examples and applications, to help learners understand and apply the concepts in a meaningful way. Challenges and limitations of each technology or concept should also be discussed to provide a well-rounded understanding.