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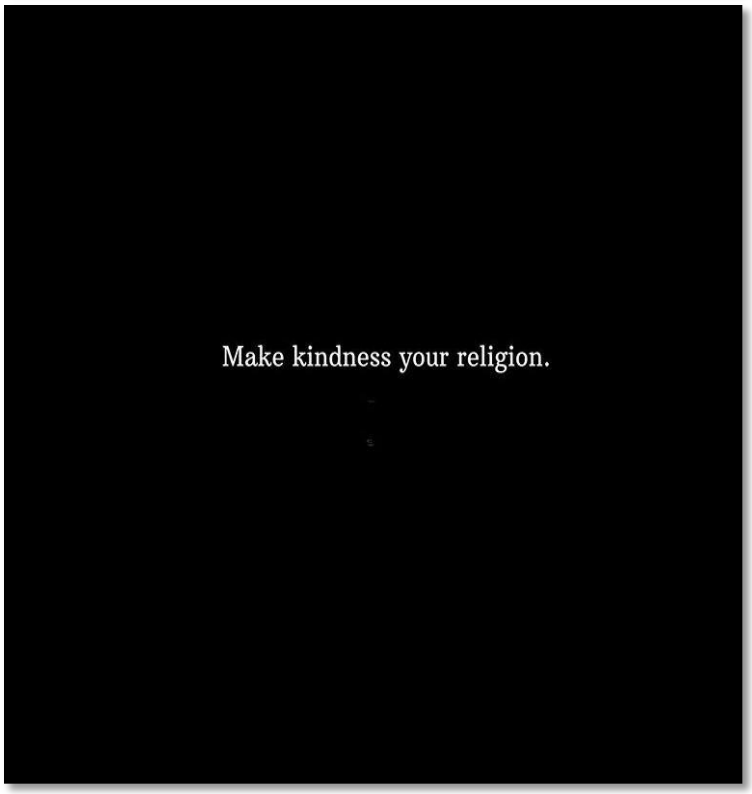
# BITS & BYTES

An Initiative By

ITSA

Department of Information Technology

## #SATYAVACHAN

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**Designed by Ms. Mudra Doshi & Mr. Akshay Agrawal**

# 5 career options for Computer Science graduates

## Graduated in Computer Science? What's next?

One of the most integral parts of the present world is computer science that includes several activities. Be it online games, shopping, tracking, communication, fitness, and health progress, computer science is all around with the latest technological trends. It is considered the highest-paying, lucrative, and rapidly growing career option.

The efficiency of businesses is increased with the information systems where IT managers and system analysts can work together to come up with accurate solutions. So, if you are a computer science graduate, then here are the career options that you might pursue.

**1. Software Developers:**

A CS graduate majorly works on software development for smartphones, computers, and tablet-like devices. The software programs also work on word processors and web browsers with developers working on maintaining, testing, and developing the programs for several software applications.

**2. Artificial Intelligence Engineer:**

As the latest technology of Artificial Intelligence, its development has gone to the next level with platforms that can manage day-to-day tasks easily. Additionally, it is simple, easy, and improves the whole tasks that were managed manually traditionally. The AI programmers can work easily for diagnosis of diseases, business process management, image processing, speech recognition, etc.

**3. Cloud Computing Engineer:**

Next in the list of thriving technologies is Cloud Computing that includes software, database, storage, servers, intelligence, and analytics. The developers work on such computing services as companies Google Cloud Services (GCS) and Amazon Web Services (AWS). With technology like cloud computing, businesses can easily upload the data on websites, files, and build infrastructure over the internet.

**4. Information Security Analyst:**

They are responsible for protecting information networks with cutting-edge systems to avoid any type of security breaches. The analyst works on maintaining system integrity and data security to prevent major issues.

**5. Database Administrator (DBA):**

For a detail-oriented and analytical person, it is best to go for a job that can use these skills like DBA. It is a great platform that evaluates, analyzes, and organizes the data easily in regards to the database. The DBA works to organize, store, and analyze the data for security and retrieval in case of security breaches. The Database administrator works to solve major problems and malfunctions easily before the error can go beyond the repair scenario.

***Source:*** **https://content.techgig.com/top-5-career-options-for-computer-science-graduates/articleshow/80219709.cms**

**- MR. AKSHAY AGRAWAL**

**(ASSISTANT PROFESSOR)**

## Composting: Art and Science of Organic Waste Conversion to a Valuable Soil Resource

Composting is the transformations of raw organic materials into biologically stable, humic substances suitable for a variety of soils and plant uses. Essentially, composting is controlled decomposition, the natural breakdown process that occurs when organic residue comes in contact with soil. Composting is an ancient technology. There are Roman and biblical references to composting and numerous accounts of farmer composting practices in subsequent millennia. George Washington, the nation's first president, was also the nation's first recognized composter. Washington was acutely aware of the degradative effects of farming on the soil resource, and he built a "dung repository" to make compost from animal manure so he could replenish the soil's organic matter.

Sir Albert Howard was probably the first agricultural scientist to bring a scientific approach to composting, almost 75 years ago in India. His Indore process involved stacking alternate layers of animal manure, sewage sludge, garbage, straw, and leaves. Stacked material was turned occasionally over 6 months or longer, and leachate from the decomposing residues was recycled to maintain adequate moisture in the piles. Current composting practices use essentially the same principles that Howard promulgated.

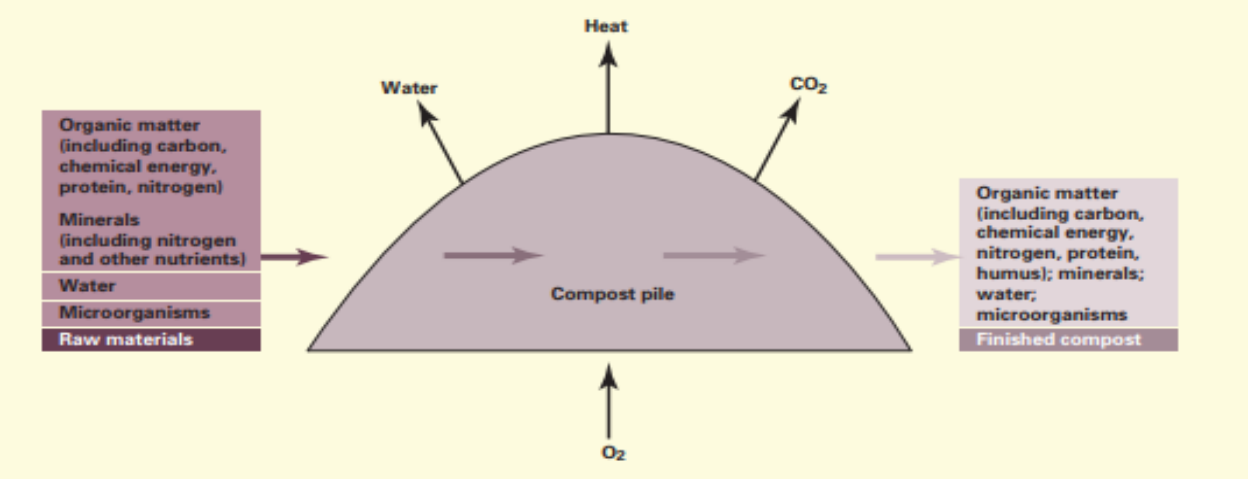
As agriculture became increasingly mechanized after World War II, use of synthetic fertilizers replaced the practice of applying manure or compost to soil to maintain soil fertility, and composting fell into disuse. In recent years there has been resurgence in composting initiatives at various levels as urban and rural areas face increasing landfill costs and decreasing landfill space.

In a recently released study of composting trends in the United States,5 85% of the nation's municipal waste stream was identified as organic.6 This translates to approximately 177 million tons of organic waste per year, mostly as food scraps, yard trimmings, and paper. It does not include organic waste generated from agricultural and industrial sectors, including food processing, paper production, biotechnology, forest products processing, and livestock production. If all of these materials were composted, the estimated potential market demand for finished compost would greatly exceed the amount of compost produced. Markets include agriculture, silviculture (forestry), residential retail, nursery sod and ornamentals production, and landscaping, with a demand of approximately 1.27 billion tons of finished compost annually. Depending on the type of waste and the method of composting, average national savings from composting of municipal organic by-products over conventional landfill disposal range from $9 to $38 per ton.

The news keeps pouring in and the information can be overwhelming and scary. You may have anxiety and fear due to a lot of issues such as dealing with at-risk family members or patients, trying to keep kids occupied while being indoors all day, managing to get work done while at home, or simply adjusting to the new situation. As the days go by, the stress can add up and affect you both physically and mentally.

**Chemistry, Physics, and Biology of Composting**

Since composting is a microbial mediated process, providing the proper environmental conditions for microbes to decompose raw organic materials is crucial for success.




The three most important factors for making good compost are the chemical makeup of the raw ingredients or feedstocks (quality and quantity of carbon and minerals, pH), the physical size and shape of the feedstocks and the porosity of the pile, and the population of organisms involved in the composting process (macrofauna and mesofauna; microorganisms including bacteria, actinomycetes, fungi).

Microbes break down organic compounds to obtain energy to carry on life processes. Under aerobic conditions, the “heat” generated in composting is a by-product of biologic “burning,” or aerobic oxidation of organic matter to carbon dioxide. If the proper amounts of food (carbon), water, and air are provided, aerobic organisms will dominate the compost pile and decompose the raw organic materials most efficiently. Optimal conditions for rapid, aerobic composting include carbon-nitrogen (C:N) ratio of combined feedstock's between 25:1 and 35:1, moisture content between 45% and 60% by weight, available oxygen concentration greater than 5%, feedstock particle size no greater than 1 inch, bulk density less than 1,000 pounds per cubic yard, and pH between 5.5 and 8.5

**Microbial “Food” Quality**

The supply of carbon relative to nitrogen (C:N ratio) determines whether net mineralization or immobilization of nitrogen will occur. Mineralization is conversion of organic nitrogen to mineral forms (i.e., ammonium and nitrate); immobilization is incorporation of nitrogen into microbial biomass. As a general rule, if the C:N ratio is greater than 20:1, microbes will immobilize nitrogen into their biomass. If C:N is less than 20:1, nitrogen can be lost to the atmosphere as ammonia gas, causing odour. In general, green materials have lower C:N ratios than woody materials or dead leaves do, and animal wastes are more nitrogen rich than plant wastes are. The complexity of the carbon compounds also affects the rate at which organic wastes are broken down. The ease with which compounds degrade generally follows the order carbohydrates > hemicellulose > cellulose = chitin > lignin. Fruit and vegetable wastes are easily degraded because they contain mostly sugars and starches. In contrast, leaves, stems, nutshells, bark, and tree limbs and branches decompose more slowly because they contain cellulose, hemicellulose, and lignin. Water Requirements Low moisture content impedes the composting process, because microbes need water. Low moisture also makes compost piles more susceptible to spontaneous combustion, because moisture content regulates temperature. Moisture content in excess of 60% means pore spaces in the compost pile are filled with water rather than air (oxygen), leading to anaerobic conditions. Feedstock's with different moisture-holding capacities can be blended to achieve ideal moisture content. Carbonaceous materials such as newspaper and wood by-products such as sawdust are often used as bulking (drying) agents.

***Source:*** https://watermark.silverchair.com/labmed31

**- MR. ALLAN LOPES**

**(ASSISTANT PROFESSOR)**

# ANNOUNCEMENT

**AYES 2020-2021 IS COMMENCING FROM WEDNESDAY 27TH JANUARY 2021.**

# UPCOMING EVENT


**HACKSTOMP 2021 – AN EVENT TO SHOWCASE YOUR TECHNICAL TALENT WILL BE ORGANISED SOON ONLINE IN THE MONTH OF FEBRUARY**

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