Stellenbosch UNIVERSITY IYUNIVESITHI UNIVERSITEIT
Engineering EyobuNjineli Ingenieurswese

Computer recommendation for Engineering Students in 2026

Students enrolled in the BEng programmes make regular use of personal computers. All undergraduate students in the Faculty of Engineering have 24-hour, seven-day access to the Faculty's computer user areas (FIRGA/FECUA). These facilities provide all the software required for the BEng programmes, as well as internet access and printing services. However, many students work more effectively when they have access to a personal computer at their place of residence. Any assistance in enabling students to obtain a personal computer is therefore of significant benefit.

Desktop or Laptop

Currently, laptops are by far the most popular choice. They offer mobility, and the importance of battery power during load shedding cannot be overstated. A moderately priced laptop is sufficiently powerful to meet all the Faculty of Engineering's software requirements.

Traditional desktop (non-mobile) systems offer significantly more internal space than laptops and can therefore accommodate more powerful hardware. While desktops are well suited to complex simulations, students will find that most departments provide access to such systems, either within the departments themselves or in the Faculty's computer user areas.

➔ **Recommendation:** Laptop

Windows, Macintosh, and Linux

While many major software developers release their software for all commonly used operating systems (OS), many smaller developers support only the Windows OS. Windows therefore remains the most widely used operating system for personal computing.

Students may encounter situations where required software does not run natively on Mac or Linux systems. Although workarounds are available, these are often time-consuming and require a certain level of technical expertise. It should also be noted that Campus IT provides limited support for Mac and Linux systems, and students using these platforms may experience longer turnaround times when logging faults.

➔ **Recommendation:** Windows-based system. Mac or Linux systems may be used, provided the student is willing to accommodate the additional complexity.

32-bit vs 64-bit

A few years ago, most operating systems were released as 32-bit versions. These systems are limited to addressing a maximum of 4 GB of RAM, which is well below the minimum requirements of many software packages used within the Faculty. In addition, several major software developers now release their software exclusively in 64-bit versions.

➔ **Recommendation:** A 64-bit operating system. A 32-bit system should not be considered

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RAM Requirements (Random Access Memory)

The most demanding software used by all first-year BEng students, in terms of computing resources, is Autodesk Inventor. Autodesk Inventor 2022 introduced a significant increase in system requirements compared to previous versions, and this trend is expected to continue. While the recommended requirement for Inventor is 32 GB of RAM, 8 GB is still adequate, albeit with reduced performance.

When purchasing a lower-cost computer, it is advisable to confirm whether the RAM can be upgraded at a later stage, as 32 GB may become the minimum requirement in the coming years. When a system runs out of physical RAM, it begins using hard drive space as virtual memory; for this reason, a fast hard drive is also recommended, particularly for systems with limited RAM.

Absolute minimum requirement: 8 GB of RAM, with upgrade capability

➔ **Recommendation:** 16 GB of RAM, with the option to upgrade

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CPU Requirements Intel

When considering Intel processors, three factors are important: core type, core count, and generation. As a general guide, i3 processors are the slowest, i5 offer mid-range performance, and i7 are the fastest. However, modern CPUs are sufficiently powerful that students are unlikely to notice significant performance differences between these options for most software applications.

Core count is more important: the more cores a CPU has, the more tasks it can handle simultaneously. Four cores or more are recommended, although two cores are still acceptable. Lastly, the generation number reflects Intel's architecture releases. Generation 6 (released in 2015) is the recommended minimum, while Generation 7 (released in 2017) offers significantly improved graphics performance and is therefore a better option.

Absolute minimum requirement: Any CPU that scores over 2000 points on www.cpubenchmark.net.

- Please note when you buy a laptop with an Intel chipset, we do not recommend the Intel Celeron chip. Rather consider the Intel Core i3, i5 or i7 chips

➔ **Recommendation for Intel**: 6th Generation or higher i3, i5, or i7 Intel CPU with at least four cores, 7th Generation or higher strongly recommended.

AMD

AMD has mostly been lagging behind Intel but in 2019, they released the third generation Ryzen CPUs that surpassed Intel for the most part and took the world by storm. These CPUs have high speeds, and low power usage and the versions that come with graphics have very powerful and fast graphic capabilities and generally were cheaper than their Intel counterparts. Second-

generation Ryzen CPUs also have excellent speed and graphics capabilities.

Absolute minimum requirement: Any CPU that scores over 2000 points on www.cpubenchmark.net.

➔ **Recommendation:** Any second-generation Ryzen CPU with built-in graphics and four or more cores, but third generation if budget permits.

- Note that Ryzen and Core i3/i5/i7 are not the only processor ranges available, but they serve as a useful baseline for comparison.

Graphics Requirements

Computer graphics cards come in two main flavours: integrated and dedicated. An integrated graphics card shares power and memory with the CPU and RAM, and whilst slower than a dedicated card, it is much cheaper. Dedicated cards are standalone powerhouses with their RAM and CPUs, but are much, much more expensive, often out-costing all other components of a computer. These are usually in desktops (but can be in laptops too), and their usage often accompanies games and high-end graphics applications such as video editing. For student usage, an integrated graphics card that comes with a 2 nd generation or higher AMD or a 6 th generation or higher INTEL CPU would be adequate. It should be noted that from the 7th generation, Intel integrated graphics are much faster.

Absolute minimum requirement: Intel HD or UHD integrated graphics.

➔ **Recommendation**: At least 2nd Gen AMD or 6th Gen Intel integrated graphics.

Storage Requirements

In the past, hard drives relied on mechanical moving parts and were significantly slower than the solid-state (SSD) and Non-Volatile Memory Express (NVMe) drives commonly used today. SSD and NVMe drives are considerably faster and have a noticeable impact on overall system performance, particularly on systems with limited RAM.

An SSD is sufficient for all student requirements, and it is not necessary to invest in the more expensive NVMe drives, as the perceived performance difference for typical student use is minimal. Students also receive 500 GB of cloud storage from the University, meaning local storage capacity is generally not a concern unless the computer is used for purposes beyond academic work.

Absolute minimum requirement: 240GB Mechanical Hard Drive but SSD strongly recommended.

➔ **Recommendation**: Solid State SSD Hard drive, 240GB and bigger.

Summary of recommendations & examples

(Students may use laboratory computers to supplement their own devices where these do not meet the requirements of a specific programme or application.)

Absolute minimum	Recommended
Laptop	Laptop
64 Bit Windows Operating System	64 Bit Windows Operating System
8GB Ram, Upgradable	16GB Ram, Upgradable
Intel Core i3 or i5 or AMD Ryzen 2nd Generation **(Intel Celeron – not recommended)**	6th Generation or higher Core i7 Intel CPU, or AMD Ryzen 2nd Generation or higher **(Intel Celeron – not recommended)**
240GB and bigger Mechanical Hard drive	240GB and bigger SSD Hard Drive
Intel HD or UHD Integrated Graphics	Integrated graphics that come with the recommended CPU as above

Acer Aspire 3

Intel Core i5 12th Generation Laptop

15.6" Full HD IPS Slim Bezel
Intel Core i5 12th Gen 1235U up to 4.4GHz
8GB DDR4 RAM
512GB NVMe SSD
Intel Iris Xe Graphics
WiFi IEEE 802.11a/b/g/n/ac

Lenovo IdeaPad Slim 3 Laptop

Intel Core i7 13th Generation Laptop

15.3" WUXGA (1920x1200) IPS 300nits Anti-glare, 45% NTSC, 60Hz
Intel® Core™ i7-13620H, 10C (6P + 4E) / 16T, P-core 2.4 / 4.9GHz, E-core 1.8 / 3.6GHz, 24MB
8GB Soldered LPDDR5-4800 Memory
512GB SSD M.2 2242 PCIe® 4.0x4 NVMe®
Integrated Intel® UHD Graphics

Student licenses are available for most of the software that BEng students need. https://firga.sun.ac.za/software gives details about the software available to Stellenbosch University students for installation on their devices (for example, MS Office 365 is available free of charge). The Engineering Faculty is also part of the Microsoft Ignite Premium program that makes certain Microsoft products available to our students at no cost or a very low fee.

Visit the FIRGA website for more details