

1.5 Emerging Technologies

Syllabus 2026 - 2028

WHAT YOU NEED TO KNOW

- The impact of emerging technologies on everyday life
- Artificial intelligence (AI): what it is, examples, benefits and drawbacks
- Extended reality (XR): virtual reality (VR) and augmented reality (AR), uses, benefits and drawbacks

What are emerging technologies?

Emerging technologies are new or fast-developing technologies that are starting to change how people live, learn and work. Their impact can be positive (new opportunities, convenience, safety) and negative (job losses, privacy concerns, cost).

Artificial intelligence (AI)

Artificial intelligence is the ability of a computer system to perform tasks that normally need human intelligence, such as learning, reasoning, recognising speech or images, and making decisions. AI systems learn from large amounts of data.

Area	Impact on everyday life
Personal assistants	Voice assistants answer questions, set reminders and control smart home devices.
Recommendations	Streaming, shopping and social media suggest films, products and posts based on past behaviour.
Healthcare	AI helps detect disease in scans and supports diagnosis and drug research.
Transport	Self-driving vehicles, route planning and traffic management.
Education	Adaptive learning programs and AI tutors that suit each learner's level.
Security and finance	Face recognition, and spotting unusual card activity to detect fraud.
Customer service	Chatbots answer common questions at any time of day.

Advantages	Disadvantages
+ Does repetitive tasks quickly and without tiredness	- Jobs may be lost as tasks are automated
+ Works 24 hours a day and can process huge amounts of data	- Needs large amounts of personal data, raising privacy concerns
+ Can improve accuracy and safety, for example medical scans	- Can be biased or wrong if the data it learned from is biased
+ Personalises services for each user	- Lacks human judgement, empathy and creativity
+ Can do dangerous tasks instead of people	- Systems are expensive to develop, and can be misused, for example to create fake content

Extended reality (XR)

Extended reality is the umbrella term for technologies that mix the real and digital worlds. It includes virtual reality and augmented reality.

	Virtual reality (VR)	Augmented reality (AR)
What it is	A fully computer-generated 3D environment that replaces the real world	Digital information or objects overlaid on the real world view

	Virtual reality (VR)	Augmented reality (AR)
Equipment	Headset (head-mounted display), controllers, motion sensors	Smartphone or tablet camera, or smart glasses
Real world visible?	No, the user is immersed in the virtual world	Yes, the real world is still seen with extra content added
Examples	Flight and driving simulators, VR games, virtual tours, safe training	Phone games that place characters in your room, furniture preview apps, navigation arrows, filters

Impact of extended reality

Advantages	Disadvantages
+ Safe practice for dangerous or costly tasks, such as pilot, surgeon or firefighter training	- Equipment such as headsets can be expensive
+ More engaging learning, for example virtual field trips and 3D models	- Can cause dizziness, eye strain or nausea (motion sickness)
+ Lets people try before they buy, such as furniture or clothes	- Users can lose awareness of real surroundings, risking accidents
+ Immersive entertainment and gaming	- Too much use may reduce real-world social contact
+ Can help in therapy and rehabilitation	- Needs powerful hardware and fast connections

EXAM TIP

A good answer for 'impact on everyday life' names a **specific example** and says what changes for the person, for example 'a voice assistant lets someone control the lights without touching a switch'. Know the difference: VR replaces the real world, AR adds to it.

Key terms

Term	Meaning
Emerging technology	A new or developing technology starting to change society.
Artificial intelligence	A computer system doing tasks that usually need human intelligence.
Machine learning	AI that improves by learning from data.
Extended reality (XR)	Umbrella term for VR and AR.
Virtual reality (VR)	A fully computer-generated environment experienced through a headset.
Augmented reality (AR)	Digital content overlaid on the real world.
Headset	Head-mounted display used for virtual reality.
Chatbot	A program that holds a conversation with a user.
Bias	Unfair results caused by unrepresentative data.