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جامعة تلمسان

Faculty of Technology

كلية التكنولوجيا

Department of Civil Engineering

قسم الهندسة المدنية



**Ethics, Integrity, and Intellectual Property:
A Handout for First-Year Master's Students
in Civil Engineering**

The Handout is designed for the First Year Master's Students

Prepared by

D^r Nadia HAMIMED

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Author's Preface

Integrity, ethics, and intellectual property are fundamental essences in similarly the scientific and career worlds. In the context of civil engineering, knowing, comprehending, and respecting these principles support the construction of not merely reputable engineers but also responsible people. Within the Algerian background, not all students are totally aware of these concepts, specifically in the English language. Students may well see it as a challenge to understand abstract concepts such as scholastic moralities and vocational behaviour.

This guidebook on **Ethics, Integrity, and Intellectual Property** is meant to render such subjects precise, simple, and beneficial. It is written in Basic English for novice students to back them in comprehending the ways to act in all conscience in their academic background, respect colleagues' work, and be prepared for conscientious involvement in the place of work.

I would like to deeply thank Dr. Zakia KHELIFI and Dr. Kamila Amel BENACHENHOU for their valued expertise and guidance in reviewing and polishing this work. Their insightful feedback significantly enhanced the clearness and quality of this handaout.

Within this course, students will be taught:

- How to be truthful and honest in academia as well as in the professional world
- The dangers of cheating and dishonesty, and ways to prevent them
- The worth of safeguarding ideas and having respect for scientific property
- In what way is ethics linked to technology and durable advancement?

We trust that by means of tackling these themes, students will not only be successful in their examinations but also learn crucial life competences. Students will be better set to work together, respect proficient principles, and understanding the universal meaning of novelty and responsibility.

As teachers, we aspire to support students in nurturing and cultivating these standards via plain clarifications, suitable instances, and classroom debates. As the saying goes, **you cannot build a solid building on weak foundation**. Correspondingly, we cannot construct a solid future lacking a foundation or groundwork of ethics, integrity, and respect. We trust this handout serves as a valuable guidebook for students on their journey to becoming not only good civil engineers but also truthful and responsible citizens.

Abbreviations and Acronyms

(MESRE) Ministère de l'Enseignement Supérieur et de la Recherche Scientifique

(UNESCO) United Nations Educational, Scientific and Cultural Organization

(APA) American Psychological Association

(MLA) Modern Language Association

(IEEE) Institute of Electrical and Electronics Engineers

(AALEA) All European Academies

(UNODC) The United Nations Office on Drugs and Crime

(IP) Intellectual Property

(WIPO) World Intellectual Property Organization

(AutoCAD) Automatic Computer-Aided Design

(SAP2000) Structural Analysis Program 2000

(GNU) GNU's Not Unix

(GPL) GNU General Public License

(FreeCAD) Free Computer-Aided Design

(GeoGebra) Geometry and Algebra

(FSF)Free Software Foundation

(GPL)General Public License

(INAPI) Institut National Algérien de la Propriété Industrielle

(PCT) Patent Cooperation Treaty

(ARIPO) African Regional Intellectual Property Organization

(OAPI) Organisation Africaine de la Propriété Intellectuelle

(EPO) European Patent Office

(ONDA) Office National des Droits d'Auteur et des Droits Voisins (Algeria)

(WTO) World Trade Organization

(WIPO) World Intellectual Property Organization

(AI) Artificial Intelligence

(SDGs) Sustainable Development Goals

(ICANN) Internet Corporation for Assigned Names and Numbers

(UDRP) Uniform Domain Name Dispute Resolution Policy

(CERIST) Centre de Recherche sur l'Information Scientifique et Technique

(AI) Artificial Intelligence

(DDNS) Decentralized domain name systems

(TRIPS) Trade-Related Aspects of Intellectual Property Rights

(CSR) Corporate Social Responsibility

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Introduction

Several students, who enrol at university wish to become skilful learners, not only in their domain, but in the way they act, perform, and reason. For civil engineering students, it is not sufficient to discern technical truths. It is merely as essential to understand how to behave with **integrity, honesty, respect, and responsibility**, in both academic contexts and future work.

This booklet is a useful and practical guidebook designed particularly for **non-native English students**. It concentrates on three crucial themes:

Ethics: discerning what is correct, incorrect, and unbiased

Integrity: being truthful, authentic, and reliable

Intellectual Property: to respect and defend the thoughts, innovations, writings, or any work. It makes sure that owners obtain acknowledgement and control over the way their work is utilised.

We are aware that a lot of students are inexperienced with these notions, and that studying those in English can seem tough. That is why we made this handout employing plain language, modest instances, and effortless exercises. We aim to assist students in grasping the principles behind career and academic achievement, and offer them the arguments and means to state those standards assuredly.

The booklet is split into lessons that:

- Clarify fundamental rules of conduct in class, cooperation, and research
- Explain the ways to avoid issues as plagiarism and cheating
- Instruct how to respect and defend innovative thoughts (such as inventions and writing)
- Search for the relationship between ethics, firsthand technology, and sustainable growth
- Offer practical tools, such as checklists, grids, and step-by-step approaches that aid students study multifaceted ethical dilemmas and make conscientious decisions in technical, engineering, and academic environments.

Every lecture has different exercises students can do in the classroom or at home. The course enthuses open discussion with questions, reflection, and simple writing tasks. These exercises are created not just to instruct what is correct, but also the reason it matters.

Throughout the course, students will:

- Study their dues and obligations such as university students
- Find out the way to act equitably and honourably in team projects
- Comprehend the sense and significance of academic and professional integrity
- Learn how to cite sources correctly and avoid plagiarism
- Study actual cases of ethical issues in engineering and technology.
- Use real-world ethical decision-making strategies to examine dilemmas in order to be able to make trustworthy choices in university, professional, and engineering settings.

Via the four units of this handout, learners are progressively guided from **fundamental ethical standards and integrity** (Unit 1), valuing **intellectual property and academic honesty** (Unit 2), studying the junction of **ethics, technology, and sustainable development** (Unit 3), and lastly to **employing these notions in case studies and practical exercises** (Unit 4). In moving on throughout this structure, learners are urged not merely to **think and reason analytically and take actions responsibly** but also expand the **practical abilities essential to steer values challenges together** in university and professional civil engineering contexts.

We aspire that this course assists students in constructing not just their information and acquaintance, but their personality, since in the actual world, it is not just what you know, but the manner you behave that truly matters.

Welcome to the course!

Unit 1: Ethics and Integrity

In this part, students will learn:

- ✓ What ethics signifies and why it is crucial in university and work.
- ✓ The key standards in the academic context: **morality, respect, equality, and trustworthiness.**
- ✓ The rights and duties of students, teachers, and workers according to the **Algerian University Charter of Ethics (MESRS).**
- ✓ How to behave justly in groups and avoid **unfairness, misbehaviour, and immoral conduct.**
- ✓ What **plagiarism, data falsification, and scientific fraud** mean and the way to prevent them.
- ✓ How to act correctly in teamwork, research, and a university context.
- ✓ Supplementary basic values in academic settings: truthfulness, reliability, impartiality, and academic freedom.
- ✓ The responsibilities of technical and administrative staff as well as teachers and students.
- ✓ How to prevent bias and conflicts of interest in group work and team environments.
- ✓ How to do investigation ethically, guaranteeing clarity, exactness, and communal profit.
- ✓ How to perform properly in professional settings, comprising keeping secrecy, integrity, justice, and comprehending corruption.
- ✓ How to employ real-world ethical decision-making tools, for instance checklists, step-by-step models, and ethical criss-cross.
- ✓ How to use ethical analysis via case situations to decode values into conscientious actions.

Evaluation Methods:

The assessment of this unit is founded on **continuous evaluation**, concentrating on students' comprehension of ethical notions, analytical thinking, and capacity to use ethical standards in university and civil engineering settings.

Evaluation comprises:

- **Course interaction and oral involvement**
(debates and principled analysis throughout class exercises)
- **Scenario analysis**
(separate or team answers to ethical dilemmas linked to academic and civil engineering settings)
- **Written exercises**
- **Quizzes and tests**
(MCQs, false/true exercises, vocabulary matching, and fill-in-the-blank tests)
- **Group work assessment**
- **Analytical thinking exercises**
(capacity to explain ethical decisions utilising suitable terminology and ethical bases)

Unit 1: Ethics and Integrity

1.1 Ethical Rules at University (MESRS – Algeria)

Based on the University Charter of Ethics and Professional Conduct by the Ministry of Higher Education and Scientific Research (*Ministère de l'Enseignement Supérieur et de la Recherche Scientifique (MESRS)*), Algeria, grasping the fundamental notion of ethics before studying how it applies to university life is crucial.

1.1.1 What is Meant by Ethics?

Ethics is the set of moral principles and values that direct the way people act and make decisions. In the university setting, ethics assists learners, teachers, and workers to behave with respect, righteousness, and responsibility. It signifies doing what is correct, even when nobody is observing.

At university, ethical conduct comprises:

- Evading fraud and plagiarism
- Treating people with politeness
- Being honest and taking responsibility for one's deeds
- Respecting the regulations and standards of the educational society

In Algeria, the MESRS endorses ethical instruction to guarantee that universities are areas of trustworthy, fairness, and educational community.

1.1.2 Student and Teacher Rights, and Duties

As stated by the MESRS University Charter, everybody in the university community, students, teachers, workers, and administrative staff has some rights and duties.

Students' Rights:

- Students are entitled to study in an unbiased, respectful, and protected setting
- Students are free to express their views without restrictions in academic background
- Students are granted the right to be assessed equitably and morally
- Students are entitled to the safeguarding of their data and also to confidentiality

Students' Duties:

- Students must join classes and respect academic timetables

- Students must not cheat, plagiarize, or disrespect the university community
- Students must deal with teachers, staff, and classmates with politeness
- Students must be responsible for their studies and behaviour

Teachers' Rights:

- Teachers are entitled to instruct liberally and state educational views
- Teachers have the freedom to lead investigations without meddling
- Teachers have the right to be treated justly by both learners and the administration

Teachers' Duties:

- Teachers are expected to instruct with honesty, impartiality, and responsibility
- Teachers have the responsibility to incite and inspire critical thought and academic integrity
- Teachers are committed to respecting learners' variety and privacy
- Teachers are responsible for being fair in grading and responding

The Charter endorses a cooperative and respectful setting where all factions work together for educational and individual growth.

1.1.3 Respect, Justice, Integrity, and Academic Liberty

Respect, fairness, honesty, and academic liberty are vital and dominant standards endorsed by the MESRS and are crucial for a beneficial academic environment:

Respect

- Dealing with the entire university community (students, teachers, staff) with dignity and politeness
- Accepting and being tolerant of different opinions without affront, rudeness or hostility
- Respecting the regulations, resources, and areas of the university

Justice

- Exercising judgement without nepotism, prejudice, or inequity
- Offering equivalent opportunities to all students
- Assessing students' work transparently and with well-defined criteria

Integrity

- Being honest in academic work and communications
- Submitting one's own production
- Admitting the involvement of others via citation and references

Academic Liberty

- The entitlement of teachers and students to search for ideas and communicate them
- The liberty of teachers to lead research, publish outcomes, and teach freely
- Academic liberty must be employed correctly and dutifully, and without provoking damage

1.1.4 Objectivity, Truth, and Scientific Honesty

The principles of objectivity, truth, in addition to scientific honesty are crucial to principled and accountable behaviour in educational and research settings. Such principles embody the ethical basics of knowledge production and dissemination, as defined in the Charter of Ethics and Deontology of the Algerian Ministry of Higher Education and Scientific Research (MESRS). These ethics guarantee that academic work is reliable, plain, and constructive to community.

Truth

Truth in academic and research environments necessitates an honest engagement to correctness and genuineness. Learners and researchers need to look for discovering and presenting truths as they are, avoiding transformation or falsification. Sustaining the truth includes checking information, mentioning sources correctly, and admitting doubt or weaknesses in one's work. Faking outcomes, fabricating facts, or displaying confusing data infringes the code of truth and weakens both individual and institutional integrity.

Objectivity

Objectivity signifies making educational and professional judgements founded on proof, truths, and rational analysis rather than on individual views, feelings, or outer burdens. In instructing and evaluation, objectivity guarantees just and plain assessment. Within research, it ensures that results are shown fairly, even when they go against prospects or individual ideas. An absence of objectivity might cause partial understandings, bias, or immoral decision-making, which deteriorates the trustworthiness of academic establishments.

Scientific Honesty

Scientific honesty indicates academic honesty and ethical accountability in the course of creating and transferring knowledge. It necessitates:

- Exact data gathering, examination, and performance.
- Correct recognition of the contribution and thoughts of others.
- Prevention of plagiarism, distortion, or fake findings.
- Rectification of mistakes when seen.

Moreover, scientific honesty includes respect for cooperative work and the rejection to participate in misleading methods for individual profit. Infringements of this value, like plagiarism or deception, are deemed grave ethical violations and may lead to educational or lawful penalties.

1.1.5 The Role of Academic Independence and Analytical Thinking

Academic Freedom and critical thinking are two vital supports of superior education and moral research. They compose the basis of academic development, permitting learners, scholars, and teachers to follow fact, defy traditional thoughts, and add significantly to scientific and communal growth.

Analytical thinking denotes the controlled procedure of vigorously and competently hypothesising, examining, assessing, and synthesising data collected from scrutiny, practice, analysing, or exchange. It encourages students to surpass memorisation and to participate in thoughtful decisions founded on proof and reason. Within an educational environment, analytical reasoning promotes academic freedom by fostering students to interrogate suppositions, assess arguments, notice partiality, and illustrate rational results. This practice of mind not only enhances the excellence of scholarship but also reinforces moral decision-making through endorsing academic integrity and neutrality.

Academic independence, on the flip side, guarantees that instructors, scholars, and learners can communicate their thoughts, participate in review, and publish their results with no worry of suppression or unwarranted obstacle. It defends the right to study contentious subjects and to discuss concerns truthfully, as long as such communication respects the rights of others and supports official and scientific honesty. In universities, academic independence sustains the sincere swap of thought vital for knowledge production, invention, and independent principles.

The relation between analytical thinking and academic independence is profoundly interconnected. Academic independence produces a setting where analytical reflection can prosper, while analytical thinking guarantees that independence is trained sensibly and morally. Lacking the independence to question, rationalise, debate, and examine, intellectual progress turns to be restricted; with no analytical thinking, independence dangers worsening into negligence or academic rigidity.

Promoting analytical reflection and academic independence is vital for civil engineers and other applied sciences. It permits upcoming professionals to examine multifaceted issues, assess moral effects, and make proof-founded decisions in their investigation and practice. Supporting these standards not only reinforces scientific honesty but also trains student to proceed correctly in their careers and communal roles.

1.1.6 Responsibilities of Administrative and Technical Personnel

Administrative and technical personnel have a crucial and frequently under-acknowledged position in supporting principled values, institutional honesty, and the general excellence of educational life in institutions of higher education and research. Their duties go beyond active and logistical missions; they are essential performers in keeping an atmosphere that sustains justice, plainness, and the search for scientific and scholastic quality.

Administrative staff is in charge of guaranteeing the smooth running of official authority, comprising the managing of learners' proceedings, economic procedures, study documents, and interaction among diverse educational elements. Principled management needs exactness, privacy, fairness, and responsibility. These workers must control subtle data, like scrutiny findings, study information, or private folders, with carefulness and integrity, ensuring that institutional choices are founded on skill and equality instead of nepotism or external pressure.

Technical personnel, sequentially, are significant in backing up instruction and study actions via their proficiency in research laboratories, ateliers, reading rooms, and scientific substructures. Their moral responsibilities comprise guaranteeing security, dependability, and acquiescence with expert values when employing devices, running facts, or upholding equipment. They have to show accuracy, accountability, and reverence for academic property, especially when managing secret or unissued research resources. Furthermore, they add to the prevention of educational misbehaviour through ensuring that processes are done clearly and that findings are attained via legal and verifiable methods.

Administrative and technical staffs have both a shared accountability to endorse institutional honesty. This involves avoiding dishonesty, preventing conflicts of interest, and declining any kind of bias or unethical behaviour. Moreover, they are required to promote a respectful and inclusive workspace, in which communication between learners, faculty, and personnel is directed by proficiency and shared esteem.

In the setting of university, the moral engagement of administrative and technical personnel reinforces the reliability of the whole academic society. Their obedience to values like discretion, fairness, carefulness, and community service guarantees that the organisation functions plainly and stays loyal to its mission of progressing learning and assisting community.

Through achieving these duties, administrative and technical workers support the same principles which guide instructing and research: integrity, accountability, fairness, and reverence for individual dignity. Their function is thus not just supportive but essentially ethical, donating to a culture of faith and quality at the centre of academic being.

1.2 Accountable Behaviour and Performance in Study and Research

To be thorough and responsible in study and research means proceeding and performing with uprightness, sincerity, equality, and respect for everyone. Additionally, whether working alone or in a group, you must respect and obey ethical rules and avoid misbehaviour. This constructs trust in your work and aids you in growing to be a trustworthy student, researcher, or professional.

1.2.1 How to Work Equitably in Teams

In university, students frequently work in groups to accomplish tasks or projects. Therefore, to work honestly signifies:

- Distributing chores fairly: All peers should fulfil and accomplish their part, without letting one person do all the tasks.
- Accepting each other's thoughts: You need to listen, debate, and consider diverse views.
- Telling the truth regarding your contribution: You must not take credit for work you did not do.
- Assisting feeble group members: You need to back up the ones who struggle rather than overlooking them.
- Solving problems serenely: You need to discuss honestly and tranquilly if divergences or discord happen.

Impartial collaboration promotes teamwork, respect, and problem resolution, all of which are crucial in engineering vocations.

1.2.2 Ways to Avoid Discrimination and Misbehaviour:

At a first level, we need to define discrimination and misbehaviour. Discrimination signifies treating another person unjustly because of their:

- Sex
- Religion
- Ethnic upbringing
- Incapacity
- Language
- Beliefs

Misbehaviour denotes any awful, immoral or deceitful conduct, such as:

- Pestering, i.e. harassment (bodily, verbal, or electronic)
- Intimidation or menacing peers
- Cheating in examinations or projects
- Fibbing, i.e. lying to teachers or simulating presence

To avoid discrimination and misbehaviour:

- Giving all classmates, teachers, and staff equal respect.
- Utilising well-mannered language, even if there are divergences and conflicts.
- Respect and obey university regulations and speak up if someone is being treated unethically.
- Be flexible and tolerant: each individual has a dissimilar background and mindset.

Universities have zero tolerance for discrimination and harassment; these deeds will lead to grave disciplinary outcomes.

1.2.3 What Plagiarism Means and How to Avoid It

Plagiarism is the action of copying the thoughts, words or work of another person and presenting them like yours and lacking to acknowledge the original authors.

Widespread Instances of Plagiarism:

- To copy-paste from the internet with no citation
- To employ a peer's work as yours
- To submit a report you did not write
- To convert a writing to a different language without citing the source

How to Avoid Plagiarism:

- You are expected to utilise your own words to communicate your thoughts.
- If you employ someone else's words, you must write them between quotation marks and mention the source.
- When you utilise thoughts or information, you must cite where it originates from (book, paper, and website).
- You must learn reference styles (like American Psychological Association (APA), Modern Language Association (MLA), etc.)
- You need to employ plagiarism detection tools to verify your work.

Authentic work is better considered and respected than stolen work. It aids you in acquiring, developing, and constructing self-confidence.

1.2.4 What Scientific Fraud Means (e.g., Fake Data)

Scientific fraud refers to cheating or lying in research or academic work. Therefore, it is extremely grave and harms your status as a student or an upcoming engineer.

Kinds of Scientific Fraud:

1. Falsification: When you alter or adjust study information to present untrue results.
2. Fabrication: When you design counterfeit data or outcomes which were never experienced.
3. Plagiarism: When you copy other academics' work without recognition.
4. Ghost authorship: When you claim contribution to work you did not contribute to.

Why Scientific Fraud is hazardous:

- Because it leads to untrue knowledge and pertinent resolutions in actual projects (buildings, roads, etc.).
- As it can provoke mishaps or fatality in civil engineering, if incorrect data are utilised.
- As it ends, trust in researchers, science, and universities.
- Students or researchers can be dismissed, waste their work, or face lawful consequences.

Hence, an accountable student or researcher should do the following:

- Convey genuine, truthful findings, though they are not flawless.
- Maintains thorough annotations of all tests, trials, or results.
- For no reason, altering data to obtain a better outcome.

1.2.5 Avoiding Falsification and Endorsing Research Honesty

The honesty of research relies on the truthful and precise creation, examination, and conveyance of information. Among the gravest violations of scholastic ethics are falsification and forgery, which openly weaken scientific trustworthiness and community trust. Avoiding these kinds of misbehaviour and endorsing a culture of honesty are crucial to guaranteeing that research adds honourably to facts, invention, and the societal benefit.

Comprehending Falsification and Fabrication

Two main kinds of information manipulation are known within academic and scientific work:

- Fabrication denotes making up information, outcomes, or conclusions which never truly happened. This can comprise fabricating review answers, trial findings, or references. For instance: A learner writes down a review and comprises numerical findings for a workshop experiment that has never been led.
- Falsification means manipulating research resources, information, or findings to distort the real results. It may comprise altering measurements, regulating numbers, or selectively excluding facts that disproves the wanted result. For instance: academic changes trial conclusions to render them look more positive than they actually are.

Both of these deeds involve scientific fraud. They demolish the dependability of research and infringe the standards of honesty, which is vital to scientific and educational system.

Reasons of Falsification

Actions of falsification frequently originate from strain, miscomprehension, or poor educational habits rather than purposeful spite. Certain usual reasons comprise:

- Constraint to win or issue findings rapidly.
- To be afraid of disappointment or letting down a superior.
- Absence of pratising in research approaches and ethics.
- Rivalry among colleagues or institutions.
- Disregard in verifying or handling information.

Identifying these constraints aids institutions of higher education to plan prevention plans that tackle both ethical consciouness and the operational setting of academics and learners.

Results of Falsification

Both falsification and fabrication have grave educational, professional, and societal results:

- For the person: punitive actions, discharge from research projects, lack of reliability, or annulment of grades.
- For the institution: harmed reputation, removal of fundings, and the institution will lose society's trust.
- For the community: waste of supplies, deluding scientific development, and danger to public security in practical domains like medicine, engineering, or technology.

As research is advancing, a single falsified finding can deform upcoming reports and damage complete domains of investigation.

Endorsing Research Integrity

In order to avoid misbehaviour, organizations and persons must vigorously endorse research honesty, a series of ethics and conducts that guarantee that research is led dutifully, clearly, and morally. Main approaches comprise:

1. **Instruction and Guidance:**
Learners and academics need to obtain regular training in research principles, information managing, and reference norms. Lectures and ateliers on academic honesty aid in enhancing principled reactions prematurely in their professions.
2. **Clearness and Documents:**
Each phase of research, from information gathering to examination, must be sensibly recorded and provable. Keeping transparent documents avoids mistakes and offers responsibility.
3. **Direction and Guidance:**
Superiors should demonstrate ethical behaviour and direct learners in accountable research habits. Direct communication endorses integrity and decreases the urge to falsify findings.
4. **Colleague Appraisal and Teamwork:**
Analytical input from colleagues aids to detect discrepancy or dubious conclusions prior to publication. Teamwork also reinforces the culture of cooperative accountability.
5. **Institutional Backing and Penalties:**
Universities must ascertain transparent methods for documenting and examining misbehaviour, as well as fair penalties for confirmed instances of distortion or fabrication. Simultaneously, a reassuring setting that values honesty over production must be kept.

Ethical Thinking in Practice

Research honesty is not restricted to preventing fraud; it is a continuous ethical engagement. It comprises:

- To be honest and transparent at each phase of the research procedure.
- To respect the scientific approach and recognize all drawbacks.
- To acknowledge that undesirable or uncertain conclusions are worthy involvements, not flops.
- To grasp that integrity preserves not only the reliability of research but also the self-esteem of the scholar.

As aspiring academics and professionals, learners need to comprehend that ethical behaviour is indivisible from scientific quality. Honesty guarantees that study results are dependable, productive, and useful to society.

1.2.6 Embracing a Responsible Behaviour in Research

Embracing a responsible behaviour in research is vital to conserving the trustworthiness, clarity, and communal principle of scientific investigation. It denotes the moral and proficient conducts required from scholars at each phase of the research procedure, from the formation of a thought to data gathering, examination, issue, and distribution. Liable behaviour needs respect for integrity, objectivity, precision, and responsibility.

Scholars are morally attached to create research that stick to procedural consistency, respect individuals and conservational good, and prevent any kind of distortion or partiality. Moreover, they have to guarantee that their study sticks to institutional, national, and international research ethics standards. This includes obtaining appropriate consent, maintaining confidentiality, acknowledging collaborators fairly, and providing accurate data and references.

An accountable scholar acknowledges that scientific research is not done in isolation but as part of a wider public that relies on responsibility, confirmation, and rational integrity. Through applying accountable behaviour, researchers preserve the honesty of science; encourage community assurance in research organizations, and donate to wisdom that truly profits people and upcoming generations.

1.2.7 Working for the Benefit of Society

Research and academia have to be eventually in service of the society interest, the shared welfare and development of community. To working for the society profit signifies that learners, instructors, and scholars participate in educational and research activities that give priority to public good, fairness, and maintainable advancement over individual interest or institutional status.

This moral standard necessitates scholars to ask these questions: *Who profits from my research? And how does it help in resolving practical issues?* Within practice, to work for the society benefit includes a work that tackles society requirements, ecological preservation, communal fairness, and scientific novelty which enhances living values. Furthermore, it signifies guaranteeing clarity and availability of findings, particularly when openly financed study is included.

In colleges, embracing a societal-service attitude feeds communal accountability, fosters interdisciplinary partnership, and reinforces the relationship between scholastic organizations and their societies. When persons work for the community gain, they reconfirm that information is a collective reserve, a device for power, advancement, and principled guidance.

1.2.8 Fighting Academic Misbehaviour and Fraud

Fighting academic misbehaviour and deception is an insistent moral importance for scientific and research organizations worldwide. Academic misbehaviour involves distortion (changing information or findings), falsification (controlling scientific materials or information), as well as plagiarism (not acknowledging the work of others). These immoral misconducts misrepresent the research documents, and damage society's trust in knowledge.

To combat misbehaviour, institutions have to endorse a culture of scientific honesty via learning, plain and clear methods, and responsible means. This involves offering transparent parameters on information managing, and sources, in addition to guaranteeing just examination procedures when misbehaviour is assumed. Scholars, superiors, and learners share the accountability of producing a setting in which ethical consciousness, integrity, and sincerity triumph over rivalry or anxiety to publish.

Moreover, fighting fraud necessitates growing ethical pliability, the capacity to repel exterior or interne pressures that can direct to immoral selections. Scholars should obtain practice on the way to perceive and inform deceitful actions and should comprehend the conclusions, both punitive and ethical, of infringing standards rules. Supporting honesty in research preserves not only the academic documentation but also the ethical trustworthiness of university all together.

1.3 Ethics at Work

Ethics at work denotes the number of ethical standards and values that guide professional conducts at work. It comprises keeping privacy by defending and protecting confidential or delicate information, behaving with truthfulness, integrity, and justice in all work-linked tasks, and maintaining honesty in both individual and group efforts. A vital element also involves comprehending what corruption means, like kickbacks (bribery), prejudice, discrimination or misuse of position, and knowing the way to fight and report immoral practices. On the whole, ethics in the workplace makes sure that every individual does his part honestly, adds a positive way to their work atmosphere, and aids in constructing an environment of trust and liability.

1.3.1 What Confidentiality Means?

Confidentiality signifies maintaining delicate or personal information confidential, i.e. top-secret and in no way revealing it without authorisation or consent. In the workplace, workers frequently have access to private, monetary, or technical data that must be guarded.

Instances in civil engineering:

- Project schemes, plans, designs, or technical documents

- Internal company or firm strategies or pricing data
- Customers' or clients' information and contracts

Why confidentiality matters? Confidentiality is fundamental and imperative for the following reasons:

- Because it creates trust between the workers and the boss or the company
- As it protects the reputation and the status of the firm
- Since it keeps away from legal problems and concerns connected to information privacy and intellectual property

Moreover, in Algeria and universally, respecting and valuing confidentiality is a key element of a professional code of behaviour (UNESCO, 2005; MESRS, 2020). Additionally, breaching confidentiality will lead to punitive action, or you can lose your job.

1.3.2 How to be Honest and Fair in a Job

Honesty and fairness are essential ethical standards in any work. In the civil engineering context, this signifies providing precise data, respecting goals and deadlines, never cheating in reports or measurements and dimensions, and coping with co-workers and clients correspondingly and similarly.

Honest conduct comprises:

- To confess errors and mistakes rather than to conceal them
- To acknowledge the contribution of others when necessary
- To report issues, if any, or risks and dangers honestly
- To refuse kickbacks or gifts for favours

Fairness in the workplace is about:

- Alike treatment of colleagues, no matter their sex, religion, or upbringing
- To make decisions based on merits and skills, not private relations
- To offer others the opportunity to contribute to teamwork

Behaving with honesty and fairness demonstrates that an employee is trustworthy and can be relied on in positions or places of responsibility. Like the European Code of Conduct for Research Integrity affirms, fairness and transparency are essential to maintaining ethical standards in both academic and professional settings (ALLEA, 2023).

1.3.3 Comprehending Conflicts of Interest

Ethical behaviour in educational, scientific, and professional environments requires that all actions and choices be guided by honesty, clarity, and fairness. A foremost challenge to such standards ascends

when individual, economic, or career profits intervene, or seem to intervene, with one's impartiality. This case is recognized as a conflict of interest.

Comprehending and controlling conflicts of interest are fundamental for ensuring trustworthiness, integrity, and justice jointly in the university setting and the professional world.

Definition

A conflict of interest happens when a person's private interests, like money profit, family links, or external engagements, can compromise their career judgments, freedom, or impartiality. It does not essentially signify immoral conducts have occurred; instead, it implies a danger of prejudice that needs to be recognized and run plainly.

In university, research, and work, conflicts of interest may ascend every time individual interests contest with institutional accountability or with the search for the societal welfare.

Kinds of Conflicts of Interest

Conflicts of interest can be embodied in numerous ways relying on the situation:

1. Money Conflicts:

When a scholar, instructor, or professional erects to win economically from a choice or project they impact.

For instance: Obtaining compensation or gifts from a firm whose creation is being assessed in a research.

2. Individual or Relatives Conflicts:

When private connections, like relatives, friends, or love immersion, touch or seem to touch unbiased management.

Example: A teacher grading the work of a relative or close friend.

3. Scientific or Professional Conflicts:

When a person's external engagements (checking, issuing, contesting research, etc.) interfere with their institutional duties.

For instance: A scholar employing academia sources for individual projects with no permission.

4. Institutional Conflicts:

When an institution or college's financial interests might compromise its choices or research plan.

For instance: A college taking money from a firm while assessing that similar firm's creation or invention.

Results of Unbridled Conflicts of Interest

When conflicts of interest are not professed or bridled correctly, many undesirable results can happen:

- Damaged trust: Learners, peers, or the community may interrogate the justice of educational or career choices.

- Harm to trustworthiness: Research findings, assessments, or managerial deeds may be seen as prejudiced or untrustworthy.
- Lawful and moral infringements: Concealed conflicts can guide to punitive actions, charges of corruption, or infringements of institutional rules.
- Organization damage: Unbridled conflicts may damage the status and honesty of the whole institution.

Eventually, conflicts of interest weaken the essential worth of objectivity; the capacity to make decisions founded only on truth, proof, and moral standards.

Identifying and Announcing Conflicts of Interest

The most efficient method to controlling a conflict of interest is to identify it as soon as possible and announce it plainly. Moral accountability does not mean never having an issue, but in recognizing it truly and doing the necessary actions to prevent unwarranted effect.

Best approaches comprise:

- Revelation: Always declare to the appropriate authority (superiors, boards, or boss) about any possible or apparent disagreement.
- Recusation: Desist from engaging in choices or assessments in which fairness may be absent.
- Clarity: Record and converse plainly any links or interests that could increase moral apprehensions.
- Institutional control: colleges and firms should found official rules for announcing and controlling conflicts of interest.

Management of Conflicts in Scientific and Professional Being

Within the setting of research, conflicts of interest frequently result from sponsorship, issuing, and partnership. Scholars must:

- Revele money backing or fundings.
- Make sure that findings are reported truly, in spite of sponsorship results.
- Preventing consenting situations that limit issuing or information sharing.

In professional and engineering environments, like civil engineering or commerce:

- Workers must not employ private data for individual profit.
- Directors must prevent nepotism in employment or pact allocation.
- Specialists must split individual profit from institutional responsibility and society security.

Keeping ethical equilibrium between private gain and communal accountability is vital to professional honesty.

Endorsing a Culture of Honesty and Clearness

The stoppage of conflicts of interest relies on the presence of a culture of plainness and discourse. Scientific and professional organisations should:

- Offer practice and consciousness programmes on moral decision-making.
- Endorse direct discourses concerning possible conflicts with no worry of retaliation.
- Encourage a plain code of behaviour describing how conflicts should be announced and talked.

Through implanting ethical thinking into everyday habits, persons learn to foresee moral quandary and to act accountably when individual interests and career obligations meet.

1.3.4 Grasping and Comprehending Corruption and Ways to Fight It

Corruption is the misuse of position or power for private profit. It involves kickbacks, nepotism, misappropriation, and dishonest conduct in both private and public sectors.

In civil engineering, corruption can cause:

- Poor-quality construction because of the utilisation of low-priced or dangerous and insecure materials
- Costly or exorbitant projects as a result of secret contracts and deals or fake expenditures
- Postponement in project delivery and loss of civic's trust

Common practices of corruption in civil engineering:

- Payments or obtaining bribes for contracts and deals
- Giving fake reports or trial outcomes
- To hire individuals based on relative or political bonds
- Employing firm resources for private benefit

Methods to fight corruption:

- Refusing unethical proposals
- Reporting doubtful activities to heads, managers or ethics commissions
- Promoting transparency and clarity in financial plans, decisions, and project reporting
- Sustaining anti-corruption laws and policies (e.g. Algerian Anti-Corruption Law No. 06-01 of 2006)

The United Nations Office on Drugs and Crime (UNODC, 2022) states that ethical education and awareness are the first steps to building a corruption-free work environment. As students and future engineers, learning to recognise and resist corruption is vital for national development and public safety.

1.4 Ethical Decision-Making Tools and Practical Frameworks

Ethical standards like truthfulness, reliability, and justice offer a strong ethical basis for university and career behaviour. Nevertheless, in everyday circumstances, people are frequently confronted with multifaceted situations in which ethical principles may conflict. In such circumstances, ethical decision-making necessitates organized analysis instead of unstructured and instinctive decision-making.

This part presents frameworks and practical tools intended to sustain students in examining ethical dilemmas methodically and making knowledgeable, liable decisions in university and professional environments, especially in civil engineering and academic contexts.

1.4.1 Why Ethical Decision-Making Is Multifaceted

Ethical decision-making is multifaceted as it infrequently includes a plain difference between correct and incorrect. Instead, people frequently confront circumstances in which numerous ethical standards oppose instantaneously. For instance, a decision can follow financial effectiveness as the same time as damaging ecological sustainability, or stick to official laws while generating societal unfairness.

In university and civil engineering settings, ethical intricacy is augmented by numerous features:

- the existence of several participants (teachers, students, community, institutions, and upcoming generations);
- stress linked to performance, time limits, and competitions;
- doubt concerning long-term results;
- struggles between individual interests and group dependability.

Consequently, ethical decision-making necessitates cautious study, analytical reflection, and the capacity to assess results beyond instant consequences. Ethical tools aid persons cross these intricacies in a reasonable and visible way.

1.4.2 Ethical Decision-Making Models: Step-by-Step Approaches

Models of Ethical decision-making offer an organized method to examine ethical dilemmas. Such models direct individuals via a set of rational stages to guarantee that decisions are morally validated and socially responsible.

A frequently utilised step-by-step ethical decision-making model comprises steps that follow:

1. **Recognizing** the **ethical** **problem**
Plainly describe the issue and resolve whether it includes ethical principles like respect, honesty, justice, or responsibility.

2. **Collecting relevant data**
Gather all essential information, comprising official laws, institutional regulations, precise facts, and contextual limitations.
3. **Recognizing participants**
Identify who is going to be affected by the decision, comprising persons, institutions, societies, in addition to the environment.
4. **Assessing potential choices**
Taking into account various options of action and evaluate their moral inferences.
5. **Evaluating results**
Examine the short-term and long-term results of each choice.
6. **Making and defending the decision**
Select the choice that best sides with moral values and defend the choice utising lucid and logical arguments.
7. **Re-examining the decision**
Consider the result and assess whether the choice could operate like a model for parallel future cases.

This organized approach inspires responsible conduct and liability in scholastic and professional drill.

1.4.3 Practical Checklists for Ethical Decisions

Ethical checklists are plain yet useful tools that aid individuals assess their choices prior to taking action. Such tools work as a precautionary device decreasing the risk of immoral conduct produced by rush, stress, or absence of consciousness.

Prior to making a decision, professionals and students may request the following interrogations:

- Does this choice respect ethical standards like truthfulness, integrity, and justice?
- Does this decision obey institutional laws and professional principles?
- Can this decision harm others or the community?
- Is every participant treated fairly and respectfully?
- Am I able to defend openly and publicly this decision?
- How would be my reaction if I were affected by this decision?

Through methodically responding to these interrogations, individuals develop moral reflection and reinforce their ethical responsibility.

1.4.4 Ethical Grids for Examining Dilemmas

Ethical grids are analytical tools which permit the evaluation of several decision choices through different ethical aspects. Grids are not like checklists, which concentrate on personal questions, they allow an inclusive assessment of competing options.

An ethical choice grid may compromise standards like:

- respect for moral principles;
- societal effect;
- ecological impact;
- lawful obedience;
- long-term durability.

Via comparing choice alternatives through these principles, individuals can envisage moral trade-offs and make fair, well-defensible decisions. Ethical grids endorse visibility, impartiality, and lucid explanation, especially in professional and civil engineering settings in which decisions have crucial communal results.

1.4.5 Short Case Situations: University and Civil Engineering Settings

Situation-based study is a forceful pedagogical tool for developing ethical analysis. Short cases permit students to use ethical tools to practical scenarios and meditate on real-world repercussions.

Scenario 1: Academic Honesty
 A student is pressured to present a project and he thinks about copying parts from an internet source without correct references. Employing an ethical checklist, the learner will know that this action infringes standards of integrity, academic honesty, and institutional rules.

Scenario 2: Civil Engineering Responsibility
 A civil engineering group of students must choose whether to employ a cheap material which meets least technical conditions but has harmful ecological consequences. By utilising an ethical choice grid, the students assess financial profits against ecological and societal responsibility, eventually choosing a green solution.

These cases incite and boost to use ethical frameworks analytically and to explain and defend their choices founded on ethical analysis instead of ease or individual interest.

Sum up:

Main Standards	Responsible Conduct
<i>Teamwork</i>	Distribute work justly, respect each other, and have equivalent responsibility.
<i>Discrimination</i>	Deal with everyone similarly, avoid any prejudice, pestering, intimidation, or mistreatment
<i>Plagiarism</i>	Always provide recognition to others' thoughts, and employ correct citations
<i>Scientific Fraud</i>	Present genuine data; for no reason cheating or lying in your research
<i>Component</i>	Description
<i>Setting of Ethical Decision-Making</i>	Ethical decision-making in university and civil engineering settings necessitates structured analysis because of the intricacy of real-world circumstances and the regular conflict between standards.

Responsible Conduct

Main Standards

Decision-Making Models

Step-by-step frameworks that direct learners in recognizing ethical problems, analysing participants, assessing results, and explaining responsible choices.

Realistic Checklists

Plain thoughtful tools that aid individuals rapidly evaluate whether a choice respects moral values, institutional regulations, and communal responsibility.

Ethical Decision Grids

Comparative reasoned tools employed to assess diverse choices according to moral, societal, ecological, and professional aspects.

Case Scenarios

Short university and civil engineering-connected scenarios that enable students to use ethical devices in real-world settings and develop ethical analysis capacities.

Pedagogical Involvement

Such tools offer practical frameworks to examine dilemmas methodically and defend responsible decisions, aiding students in converting ethical values into real, responsible actions.

Unit 2: Intellectual Property

In this part, students will learn:

- ✓ The fundamental kinds of intellectual property are industrial (such as patents) and literary and artistic (such as books or music).
- ✓ To describe Intellectual Property (IP) and its significance in university and civil engineering.
- ✓ Comprehend Algerian IP laws and main institutions (INAPI, ONDA).
- ✓ Recognize results of IP violations and how to take action.
- ✓ IP fundamentals and regulations at local (INAPI) and global levels (WIPO, TRIPS, agreements).
- ✓ Safeguarding ideas with trademarks and commerce secrets, not only patents and copyrights.
- ✓ Giving importance and employing ideas by developing them into start-ups, publications, or trade products; teaming up and sharing reliably.
- ✓ Ethics and accountability: equalizing safeguard with information sharing.
- ✓ Novelty and usefulness: guaranteeing creations are innovative, beneficial in commercial, and ethically consistent.
- ✓ How to cite sources properly in reports, presentations, and other documents.
- ✓ What copyright protects, particularly on websites, software, and online content.
- ✓ To make the difference between free software and licensed software.
- ✓ Intellectual property problems in online shopping, social media, and digital environments.
- ✓ What a patent is, its worth, and ways to apply for one in Algeria or worldwide.
- ✓ Ways to employ, protect, and add value to innovative or technical ideas.

Evaluation Methods

The evaluation of unit two is founded on **continuous assessment**, intending to evaluate students' grasping of intellectual property notions, academic integrity, and their capacity to use IP rules in university and civil engineering settings.

Assessment comprises the following:

- **Class interaction and oral participation**
- **Scenario analysis**
- **Written exercises and short tests**
- **Quizzes and assignments**
- **Reading comprehension texts and questions**
- **Academic writing tasks**
- **Teamwork assessment**

Unit 2: Intellectual Property

2.1 Fundamentals of Intellectual Property

Intellectual Property (IP) denotes the inventions of the human mind, like creations, designs, literature, compositions, software, and artistic works. These creations have worth and the law protects them, merely as material property (WIPO, 2023). Equally, in professional and academic milieus, the respect of intellectual property is indispensable for guaranteeing innovation, impartiality, and legal protection.

2.1.1 Two Chief Kinds of Intellectual Property: Industrial and Artistic

Intellectual property is generally split into two main sorts: industrial property and literary and artistic property.

Industrial Property

This type comprises:

- Creations (protected by patents)
- Industrial designs (forms, appearances of products)
- Geographical indications (e.g. Carrara marble)
- Trademarks (brand names, logos)

A patent, especially, offers the creator exclusive rights to utilise or vend a creation for a specific time, typically 20 years. Such rights inspire and boost invention through protecting original technologies (WIPO, 2023). In the civil engineering domain, patents are significant when engineers work with new building materials, environmental technologies, or structural systems

Literary and Artistic Property

This involves:

- Books, papers, and essays
- Software and online content
- Music, movies, and artworks

This kind of Intellectual Property is protected by copyright laws, which offer the inventor the entitlement to replicate, issue, and distribute their creations. Regarding students, particularly in academic backgrounds, this comprises respecting the authorship of research articles, presentations, books, and project reports.

According to UNESCO (2021), respecting both types of IP is essential in higher education to promote a culture of fairness and academic honesty.

2.1.2 How to Properly Cite Sources such as Books, Articles, and Projects

Citing sources is the correct way to acknowledge the initial creators when you employ their thoughts, words, or information in your work. The right reference not only demonstrates respect but also serves as a means to keep away from plagiarism, which is deemed to be academic misbehaviour (MESRS, 2020).

There are numerous established citation styles, for example:

- APA (American Psychological Association): generally utilised in education and social sciences.
- MLA (Modern Language Association): usually employed in the humanities and literature.
- IEEE: frequently utilised in computer science and engineering.

Such as:

- APA style:
 - *Author, A. A. (Year). Title of the book. Publisher.*
 - → *Smith, J. (2020). Ethics in Engineering. Academic Press.*
- Quoting a journal article:
 - *Author(s). (Year). Title of article. Title of Journal, Volume (Issue), page numbers.*
 - → *Ali, M. (2022). The role of patents in sustainable construction. Journal of Engineering Ethics, 14(3), 101–110.*
- Referring to a project or thesis:
 - *Student's name. (Year). Title of thesis [Unpublished doctoral thesis]. University name.*
 - → *Bendi, S. (2000). Advanced Materials in Bridge Design [Unpublished doctoral thesis]. University of Oran.*

Proper citation matters because it aids the reader in finding and locating your sources. In addition, correct references construct and foster your academic trustworthiness, and demonstrate that you are contributing to the university exchange in good conscience, truly and reliably (UNESCO, 2015).

Algerian universities follow strict regulations concerning citations and the employment of source materials, as charted in the University Charter of Ethics and Professional Conduct (MESRS, 2020). Students must quote each idea or mention that is not initially their own. If one does not respect or obey the rules, one can face academic punishment, including bad grades or being led to the disciplinary board.

2.1.3 Lawful Charter on Intellectual Property in Algeria

The lawful charter of intellectual property describes the rights and duties of persons and institutions concerning the production, utilisation, and preservation of academic and inventive products. As per Algeria, this charter is founded on a mixture of state legislature, universal contracts, and formal system intended to protect originality, inspire invention, and endorse liable information sharing.

Comprehending this basis is vital for learners, scholars, and experts, since it guarantees regard for individuals' rights and offers the rightful foundation to defend one's own academic involvements.

Meaning and Scale of Intellectual Property Law

In Algeria, Intellectual Property Law denotes the series of legal laws which guard the ethical and substantial relevance of originators and inventors. It ensures that persons, who make novel works, whether scholarly, creative, industrialized, or technical, get complete rights over their products for a restricted dated time.

Algerian intellectual property regulation differentiates between two key fields:

- Industrial Property involves copyrights, brands, industrial patterns, and geographical signs.
- Artistic and Literary Property comprises software, manuscripts, movies, songs, and academic issues, and architectural works.

The two fields intend to maintain equilibrium between the inventor's right to proprietoship and acknowledgement with the civic's right to approach and profit from information.

State Official Mechanisms and Institutions

In Algeria, the defence of intellectual property is ruled chiefly by:

- Ordinance No. 03-05 of 19 July 2003 on Related Rights and Patent.
- Ordinance No. 03-07 of 19 July 2003 on Industrial Designs, Copyrights, Brands, and Geographical Signs.
- Law No. 05-03 of 6 February 2005 gives harmonising methods for execution.

The Algerian National Institute of Industrial Property (INAPI) has a crucial position in running the recording and guard of IP rights. It is in charge of copyright appliances, brands registering, and civic consciousness crusades regarding IP preservation.

Regarding bookish and creative works, the Office National des Droits d'Auteur et Droits Voisins (ONDA) is the major power guaranteeing that originators and inventors obtain acknowledgment and payment for their creations. Moreover, it supervises patent certifying and the avoidance of theft.

Universal Contracts and Agreements

Algeria is involved in numerous global organizations and agreements which strengthen the state IP structure and match it with global values. These comprise:

- The United Nations founded The World Intellectual Property Organization (WIPO).
- The Berne Convention for the Protection of Literary and Artistic Works (since 1973).
- The Paris Convention for the Protection of Industrial Property.
- The Patent Cooperation Treaty (PCT), simplifying universal copyright appliances.

Through obeying to these treaties, Algeria compel to guarding both state and external academic creations and to promoting universal collaboration in novelty and originality.

Rights and Duties of Creators and Entities

Algerian IP regulation acknowledges two classes of rights:

1. Ethical Rights defend the originator's private connection with their creations. Such rights are perpetual and immutable. They involve the privilege to assert ownership, to protest to falsification or misulisation of the product, and to choose how and when it is made broadcast or freely available.
2. Monetary Rights permit the inventor or rights-owner the complete capacity to recreate, share, stage, or adjust the creation for gain. Such privileges are regulated in time, after that the work goes in the communal area.

Entities, comprising students and scholars, as well experts have particular duties: to mention references precisely, respect patent restrictions, and prevent piracy or unpermitted recreation. Not complying with such rules can cause punitive, public, or even criminal punishments.

Institutional Appliance in University and Research

In Algerian high school and research epicenters, the official charter of intellectual property is thoroughly related to the morals and ethics of scientific work. It guarantees:

- Acknowledgement of sources and production in essays, dissertations, papers and treatises.
- Defence of software, samples, or projects created by learners and academics.
- Rules and recommendations for cooperation between higher education and business (particularly in copyright appliances and combined study).
- Rule of information distribution and online issuing in the environment of accessible knowledge.

Therefore, the lawful charter has jointly a protecting and a scholastic utility, endorsing ethical consciousness, creation, and state technological development.

Challenges and Imminent Perceptions

Although a strong lawful basis, numerous challenges persist:

- Restrained consciousness of intellectual property privileges amid learners and scholars.
- Feeble application versus theft and forging.
- Scarce of institutional guidance and instruction in IP running and technology transmission.

To tackle such lacks and challenges, Algeria aspires to reinforce partnership between research centers and institutions of higher education, and business associates. Creativities comprise online files for copyright data, ateliers on IP knowledge, and incorporation of IP learning into universities programmes.

2.2 Copyright and Digital Tools

In nowadays digital era, civil engineering students employ software, websites, online papers, and videos in their university and professional world. That is why grasping or comprehending copyright law is vital to avoid violating legal and ethical regulations when utilising numerical resources. Furthermore, copyright offers legal protection to inventors of digital materials like websites, software, videos, articles, and pictures. Misutilizing or copying such contents without authorisation will cause severe and grave penalties, including academic punishments or legal consequences (WIPO, 2023).

2.2.1 Copyright for Software, Online Content, and Websites

Copyright exists to protect original electronic inventions like web pages, computer programmes, statistical charts, online papers, and videos. This signifies that:

- You are not allowed to copy or distribute a computer programme or web design without authorisation.
- It is an obligation to acknowledge the original authors of internet-based papers, digital books, or instructional videos in the case you employ them in your study or project showcase.
- Screen captures, statistical charts, and technical illustrations found online are as well protected and must be correctly referred to.

For instance, structural analysis software utilised in civil engineering, such as Automatic Computer-Aided Design (AutoCAD) or Structural Analysis Program (SAP2000), is under the protection of copyright law. In addition, to utilise, to copy, or to share software with no legal license or authorisation is judged unlawful and prohibited (UNESCO, 2015). In the same way, website content comprising layout, code, and multimedia is likewise legally protected unless plainly indicated as publicly available code or open access.

Correspondingly, for the World Intellectual Property Organisation (WIPO 2023), all original digital content is automatically copyrighted as soon as it is designed, with no need for official registration in most nations.

2.2.2 Copyright for Databases and Online Sources

Copyright defence for data collection and online assets comprise an essential feature of intellectual property rule in the current information economy. Within an age ruled by online knowledge interchange, this method of safeguarding guarantees that creator, academics, and institutions get jointly official acknowledgement and ethical recognitions for the academic exertion and original arrangement supporting their collections. The defence of data collecting and online materials is not just to protect the privileges of originators but as well to keep the honesty and genuineness of the knowledge distributed in educational and career fields.

A database, in lawful and practical terminologies, is described as an organised collection of free works, information, or contents methodically settled and independently reachable by digital or further ways. As the truthful or quantitative information within a data collection are classically believed to be owned by the civic field and consequently not exposed to intellectual property right, the original assortment, organisation, or design of such information represents a unique academic work. This novelty, instead of the information itself, shapes the base of IP defence. For example, an intellectual data collection including references, trial findings, or technical descriptions may obtain IP guard when its arrangement, category, and descriptive data structure show academic labor and innovative ruling.

Likewise online resources, comprising digital depositories, software E-learning systems, digital books, online libraries, and other digital products, are exposed to IP regulations that defend jointly their material and their electronic borders. The online background, nevertheless, presents multifaceted challenges like illegal copying, modification, resharing, and business misuse of copy-secured contents. These problems required strengthened lawful and moral structures able of tackling the weaknesses inherent to the online environment. Therefore, clients are asked to obey firmly to copyright laws through getting earlier permission, mentioning sources suitably, and abstaining from deeds of copy, deception or information theft. Moral online citizenship therefore grows to be a basis of liable scholastic and professional behaviour.

Internationally, several contracts and treaties, comprising the Berne Convention for the Protection of Literary and Artistic Works (1886) in addition to the WIPO Copyright Treaty (1996), have founded consistent values for data collection and online material guard. A lot of countries, comprising Algeria, have included these standards into their local legislature to align with international intellectual property rules. A copyright norm in Algeria, for example, identifies data collection compilers and online material designers as legal right owners and states the span of their ethical and financial privileges. Nevertheless, to mantain an equilibrium defence with the community notice, lawful conditions as well permit restricted exclusions, like replica for instructing, studying, and research drives, under the policies of just employment or impartial commerce. These allowances promote fair entry to information while avoiding the dominance of online knowledge.

Comprehending the structures of intellectual property rights for data collections and online sources is consequently vital for scholars, academics, and learners working in progressively digitalized knowledge and research settings. This consciousness promotes moral knowledge managing, guarantees agreement with universal principles, and fosters the liable utilisation and distribution of digital material. At last, the defence of data collections and online resources preserve private creativity and inspire novelty, teamwork, and maintaible information making within educational, technical, and experts' societies.

2.2.3 What is Open and Free Software?

Free or open software denotes software where users are allowed to freely use copy, alter, distribute or share. Nevertheless, the word free alludes to freedom, not cost; yet free software still has rules to follow, frequently imposed under a license agreement, like the GNU General Public License (GPL).

For Free Software Foundation (2022), free software must offer the following rights:

1. The right to use the programme for all aims.
2. The right to learn and alter the programme.
3. The right to redistribute copies to aid others.
4. The right to enhance the programme and present advances to everyone.

Instances of free software employed in teaching and learning, as well as engineering, involve:

- LibreOffice (a substitute for Microsoft Office)
- FreeCAD (utilised for 3D modelling in engineering projects)
- GeoGebra (employed for mathematical modelling)

Even though free software is free and open, users must respect the license terms, like citing the original inventor and sharing altered forms under the same license (FSF, 2022).

2.2.4 Copyright in Social Media and Online Shopping

Within the framework of social media and online shopping, copyright affects product pictures, videos, reviews, logos, ads, and user-generated content.

Online Shopping Platforms

- Sellers are not allowed to employ images, logos, or product descriptions from other marks without authorisation.
- Websites frequently involve terms and conditions which clarify the way users are allowed or not to utilise the content.

Social Media (e.g. Instagram, YouTube, Facebook)

- Images, videos, songs, and stories shared by social media users are instantly protected by copyright.
- Resharing someone's content with no authorisation or acknowledgement is an infringement of copyright law.
- Posting music or videos protected by copyright in your channel or page without a license will lead to the removal of content or lawful action.

UNESCO (2021) highlights that students and experts must be taught the way to navigate digital platforms properly and comprehend that digital content is not allowed to be employed unless cited. You must always verify the use rights of any content you come across on the internet, particularly when you utilise it for scholastic or expert projects.

Sum up

Theme	Main Points
Software and Websites	Copyrighted (protected by copyright) is not allowed to be copied, shared, or altered without authorisation.
Free Software	Is allowed to be freely utilised and shared, but needs to respect license rules (e.g., GPL)
Online Shopping and Social Media	Digital content (pictures, videos, posts) is protected; sharing without acknowledgement is not permitted.

2.2.5 Rights of Online Adresses and E-Commerce Platforms

The online era has deeply changed the manner information, work, and applications are made, swapped, and defended. By the rise of the Web as an international communication and commercial websites, novel methods of creative ownership have emerged, especially those linked to online addresses and e-commerce online platforms. Grasping the lawful and moral features of these online privileges is vital for learners, businesspersons, engineers, and academics who employ virtual websites to distribute their thoughts, promote their enterprises, or market their inventions.

This part offers a synopsis of the lawful, technological, and moral aspects of field title registrering and defence, in addition to the the privileges and accountabilities connected with virtual commercial actions in Algeria and worldwide.

Comprehending Web Addresses as Online Properties

An internet address is an exclusive web address which recognizes a particular site on the web, like *www.instance.com*. In addition to its technical work, a web address is as well a significant academic and business possession. It characterizes a business's uniqueness, label picture, and trustworthiness in the virtual universe.

Lawfully, a web address may be associated to a brand, because both help to differentiate the merchandises, entities, or uniqueness of one person from another. Nevertheless, while brands are recorded under copyright regulation, online addresses are listed via field designation archives under an organization run by ICANN (Internet Corporation for Assigned Names and Numbers) at the universal rank.

Lawful Defence of Online Adresses

The defence of web addresses is managed by both universal and local lawful structures meant to avoid misutilisation, misunderstanding, or violation. The most pertinent worldwide strategy is the Uniform Domain Name Dispute Resolution Policy (UDRP), directed by the World Intellectual Property Organization (WIPO). It gives a rapid and effective method for solving disagreements between online addresses' owners and brand proprietors.

As per Algeria, the registrating and managing of web addresses under the nation cipher (.dz) are managed by the CERIST (Centre de Recherche sur l'Information Scientifique et Technique), that

serves like the local archive.

CERIST guarantees that online addresses appliances obey to public rules and that no recorded label infringes present brands or civic instruction.

Main values of web addresses defence involve:

- Exclusivity: Every online address must be internationally exclusive.
- Priority offered to early applicants: Registering is allowed to the first arrival that assembles the suitability conditions.
- Honest intention: Arrivals have to register field designations for legal employment, not for conjecture or malevolents intention.

Online Addresses' Clashes and Cybersquatting

Among the main lawful problems linked to web addresses is cybersquatting that happens when persons sign up internet addresses similar or equivocally identical to famous brands or firms labels with the intention to revend them at revenue.

For instance, signing up (www.naftal-dz.com) with no permission from the Naftal firm could comprise cybersquatting. Such deeds infringe jointly brand rules and unjust rivalry values.

Agrieved parties of web addresses can lodge a claim with WIPO under the UDRP procedure or take lawful proceedings before state courts of law. The report procedure needs to demonstrate three main aspects:

1. The online address is similar or bewilderingly identical to a defended brand.
2. The account holder possesses no legal gain or right in employing the website address.
3. The internet address name was recorded and utilized for immoral intentions (e.g. for revending, replication, or fraud).

Law courts and adjudication boards can command the transmission or annulment of the website name and can as well bestow compensations to the grieved party.

Electronic Commerce and Online Copyrights

Electronic commerce (E-commerce) denotes the purchasing, revending, and swap of merchandises and facilities over the web. It involves virtual stores, online markets, payment services, in addition to websites that give virtual preparation or software.

Within the perspective of intellectual property, e-commerce presents manifold lawful and moral problems linked to:

- Electronically copyright defence for online materials (documents, pictures, videos, and software).
- Brand defence for online trademarks, logos, and goods names.
- Information theft and customer guard, particularly concerning imbursement data.
- Unpermitted utilization or imitation of online content.

In Algeria, the government implemented Law No. 18-05 of May 10, 2018, controlling e-commerce actions. This rule describes the requirements for doing digital commerce, the duties of electronic traders, and the defence of users' rights. It necessitates that each e-trade online sites be recorded with the Ministry of Trade and that digital payments are done via safe and permitted means.

Ethical and Pragmatic Factors for Learners and Professionals

As per college students, scholars, and upcoming engineers, ethical behaviour in the online area is truly as significant as lawful fulfilment. When making internet sites, digital files, or university weblogs, users must:

- Select web addresses which indicate their identification or initiative with no violation on others' brands.
- Prevent infringement through correctly mentioning references and regarding intellectual property right online materials.
- Guarantee clearness and safety in any kind of digital business or issuing.
- Guard their online identification via employing bright passwords and regarding information defence standards.

E-commerce websites, especially, must show honesty, responsibility, and user's respect. Deceptive publicity, false studies, or the vending of fake goods are severe infringements of both moral principles and lawful rules.

Online Labelling and Professional Identification

As per engineers, contractors, and scholastic institutions, the online address is not only a network identifier but also a tactical communication means. A well-selected website address can:

- Improve visibility and repute.
- Mirror professionalism and faith.
- Defend a marktrade or institutional picture from misutilisation.

Institutions frequently record numerous web addresses (e.g., .com, .dz, .org) to guarantee wider defence.

Colleges, for instance, utilise online addresses like *univ-tlem.dz* or *univ-setif2.dz* to validate their virtual presence and avoid imitation or online scam.

Universal Collaboration and Developing Trends

Internationally, the lawful defence of online addresses and e-commerce privileges is progressing fastly thanks to technological developments, globalization, and the growth of the online business. Numerous global organizations, comprising WTO, WIPO, and UNCITRAL, are developing standards and pattern rules to match online business and copyright procedures.

Incipient problems involve:

- Intercontinental quarrels over web addresses and brands.
- Decentralized Domain Name Systems (DDNS), providing devolved registrering.
- Artificial Intelligence (AI) and mechanized content making, growing new Intellectual Property interrogations.
- Copyrights in online stores which function beyond state authorities.

Being part of the international IP group, Algeria carries on renewing its legislature to face these encounters and to guarantee digital faith and novelty.

Case Studies and Applied Instances

To better comprehend these notions, contemplate the following instances:

- A group of civil engineering student makes an online site profiling eco-friendly construction schemes. If the students employ legally protected pictures or software with no authorization, they can infringe patent regulations.
- A new company names the online address *ecoconstruction-dz.com* to endorse sustainable building materials. Providing that another firm previously owns *EcoConstruction* as a brand, a lawful battle may emerge.
- A firm owner employs platforms and e-trade social media to vend handmade building gears. They ought to guarantee genuineness, customer safety, and conformity with e-trade laws.

The above intances demonstrate how lawful knowledge in online addresses and e-trade rights is a vital cleverness in currents online and expert setting.

2.2.6 Intellectual Property Rights and Online Networks

In the online era, online networks have grown to be leading digital platforms for interaction, information distribution, innovation, and expert communication. Nevertheless, the active and collaborating kind of these online platforms has increased multifaceted interrogations regarding authorship, intellectual property (IP) rights, proprietorship, and moral accountability. Comprehending the IP regulations employed within platforms settings is crucial for protecting innovative contents and regarding the rights of owners in the digital background.

Online networks, like X (previously Twitter), Facebook, Snapchat, Instagram, and YouTube, function as areas in which users create and distribute big numbers of innovative content every day, comprising documents, designs, pictures, videos, and study-based contents. While customers frequently see these online platforms like free plots, the material distributed stays safeguarded under IP rights and linked to intellectual property regulations, except if openly abandoned or permitted by the originator. The action of issuing content on online platforms does not mechanically signify that the owner resigns proprietorship rights; rather, it characteristically includes conceding the platform a restrained certificate or authorisation to exhibit or share the content along with its rules of use.

From a lawful and ethical outlook, users are liable for guaranteeing that the contents they share, post, or reutilize do not violate upon others' rights. This involves regarding the ethical and monetary rights

of material originators, recognizing ownership, preventing unpermitted recreation, and avoiding falsification or piracy. Scientific institutions progressively highlight this consciousness, especially among learners and academics that may employ online platforms for expert interaction, online issuing, or project diffusion.

Simultaneously, online platforms present novel challenges linked to attribution acknowledgement, information proprietorship, and the indistinct limit between individual and professional manifestation. For instance, resharing or changing another individual's picture, design, or study sum up with no acknowledgement may comprise an IP infringement, though effected involuntarily. Furthermore, when a scholar or technical study is posted online, it might be subjected to unpermitted plagiarism or business misuse by third parties.

Consequently, universal and state frameworks, like the World Intellectual Property Organization (WIPO) rules and Algerian IP regulations, aspire to maintain equilibrium between two vital principles: the defence of originator' rights and the endorsement of free information interchange. A lot of online platforms have as well advanced inner recording techniques and online digital marking devices to discover and online address IP violations.

For learners and experts in civil engineering and further academic domains, comprehending IP on online platforms is vital. It boosts ethical online social responsibility, guaranteeing that digital commitment adds optimistically to scholastic honesty, originality, and shared information. Through regarding intellectual property standards in online areas, consumers not only safeguard their private content but also support the standards of justice, clarity, and respect which describe liable involvement in the international information community.

2.3 Patents

First of all, a patent is a form of lawful protection given by a government to a creator. Second of all, a patent grants the creator exclusive design rights, employ, vend, or distribute their creation for a precise time, generally 20 years from the submission date. On the other hand, the creator is expected to entirely release the creation in a public paper (WIPO, 2023). As per civil engineers, patents protect innovations linked to building materials, structural systems, machinery, or environmental technologies.

2.3.1 What is a Patent and Why Is It Useful?

A patent protects a novel creation or technical resolution. Such innovation can comprise a process, machine, product, or a novel method of achieving something. The innovation is expected to be:

- New (entirely novel and not already known)
- Creative (not recognisable to others in the similar domain)
- Practical and helpful (capable of industrial or practical application)

The World Intellectual Property Organisation (WIPO 2023) states that the purpose of a patent is to encourage innovation by giving inventors a temporary monopoly. During this time, the inventor can commercialise the invention or license it to others for profit.

In civil engineering, patents protect innovative progress such as:

- Earthquake-resilient construction systems
- Eco-friendly concrete combinations
- Computerised highway or bridge building methods

Patents are significant not just for protecting thoughts but also for aiding creators to secure funding, cooperate with industries, and get competitive benefits in the work market or business area (UNESCO, 2021).

2.3.2 What Is Meant by Patentability?

The notion of patentability is at the core of technological property regulations. It denotes the series of lawful and technical conditions that a creation must have to be qualified for patent defence. In other words, *not each novel thought can be protected*; just those who meet particular standards described by regulations and show authentic originality and usefulness are judged patentable creations.

Grasping patentability is significant for learners, academics, engineers, businessmen who intend to safeguard their inventions and add ethically and morally to technological development. This part explicates the main standards, requirements, and processes which decide if a creation can be protected, with instances pertinent to the domain of technology and engineering.

Description and the Goal of Patentability

A patent is a lawful name which allows its proprietor the complete right to utilise, make, and vend a creation for a regulated time, frequently 20 years counting the day of recording. Nevertheless, prior this defence is given; the creation needs to be evaluated as stated by patentability standards.

The purpose of these principles consists of two parts:

- To guarantee that just honestly innovative and practical creations obtain safeguarding.
- To inspire technological growth and information diffusion through demanding creators to openly reveal their creations in return for provisional exclusiveness.

Therefore, patentability creates equilibrium between creation and community advantage: it recompense innovation as well as avoiding the domination of thoughts which belong to the public gain.

Fundamental Requirements for Patentability

Patentability regulations around the globe (comprising Algeria's Ordinance No. 03-07 of July 19, 2003, on Patentability) usually identify one key requirement for patentability:

Novelty

A creation must be novel, signifying it has at no time been revealed to the community anywhere in the universe prior to the recording day of the copyright appliance. This involves revelation by issuing, symposium communication, online sharing, or even talks.

If a learner or an academic exhibits a creation at a seminar or issues it online prior to submitting an application for a copyright, it wastes its originality and consequently can not be copyrighted.

For Instance: A civil engineer creates a novel kind of sustainable concrete which decreases CO₂ releases. If the formulation or procedure has at no time been issued or employed previously, it is new. However, if it was introduced in a shared report or investigation paper, it turns to be part of the civic field and cannot be protected.

2.3.3 Learn to Apply for a Patent in Algeria or Internationally

In Algeria

The Algerian National Institute of Industrial Property (INAPI) is the formal organisation in charge of registering patents in Algeria. The procedure involves the following stages:

1. Prepare a thorough patent request, comprising the creation explanation, technical illustrations, and statements.
2. Apply with The Algerian National Institute of Industrial Property (INAPI). The request can be applied online or in real-time.
3. The patent organisation inspects to verify if the creation meets legitimate conditions.
4. In case it is accepted, the patent is issued in the national patent statement and offered to the creator.

The official charters for patents in Algeria are according to Ordinance No. 03-07 of 2003, linked to industrial property. The patent is effective for 20 years and is put through yearly upkeep charges (INAPI, 2023).

International Patent Protection

For creators who desire to protect their creations in other nations, there are universal means:

- The Patent Cooperation Treaty (PCT) permits creators to make one global request, which may afterwards be employed to apply in more than 150 nations.
- The African Regional Intellectual Property Organisation (ARIPO) and the African Intellectual Property Organisation (OAPI) give local protection for African countries.

- The European Patent Office (EPO) offers admission to one patent request for nearly all European nations.

Universal patent requests need to be filed in the creator's native nation primarily, thenceforth spread universally within 12 months (under the Paris Convention) or straight via the PCT system (WIPO, 2023).

Although this procedure may be more complex and expensive, it is important and appreciated for protecting innovations with business potential across frontiers. As per Algerian academics, universities, and start-ups, comprehending universal patenting is vital for contribution to international inventions networks (UNESCO, 2021).

2.4 Protection and Intellectual Property Employment

The Protection of intellectual property (IP) signifies protecting and defending the proprietorship of one's original ideas. Therefore, in both university and work, students, academics, in addition to engineers, must understand the way to legally defend and utilise their innovations, whether they are designs, technical innovations, or written compositions. Grasping the defence and employment of IP aids in avoiding stealing, inspires invention, and sustains financial and academic growth (WIPO, 2023; MESRS, 2020).

2.4.1 How to Protect Your Creations and Ideas

To defend your thoughts, you need to take lawful and procedural steps which show you are the original inventor. Thus, there are different kinds of protection depending on the kind of intellectual property:

- Patents defend novel technical innovations or procedures. You are expected to file a thorough patent request with a local bureau such as INAPI in Algeria, or utilise universal systems such as the Patent Cooperation Treaty (PCT) (WIPO, 2023).
- Copyrights defend bookish and arty works like reports, dissertations, papers, illustrations, or PC code. In most countries and Algeria, copyright is automated upon innovation, but authors can submit their product to the Office National des Droits d'Auteur et des Droits Voisins (ONDA) for sounder lawful proof (ONDA, 2023).
- Trademarks defend brand names, logos, and slogans which recognise your creation or service.

Furthermore, in educational contexts, students also have to store their work, utilise certified and formal submission portals, and mention all sources to demonstrate the novelty of their work. Moreover, engineers who work on innovations must record each step and draft to ascertain proprietorship throughout the patenting procedure.

According to UNESCO (2015), educating students about IP rights empowers them to become innovators and ethical contributors to their fields.

What Does Protection Signify?

To defend an idea or invention signifies to get lawful acknowledgement that determines you as its creator or proprietor and to describe the requirements under which persons can employ it. This safeguarding offers you unique rights and privileges to:

- Recreate, utilise, and share your product;
- Permit or forbid its business utilisation;
- Obtain acknowledgement or monetary profit from your invention;
- Take lawful acts if others employ your work with no authorization.

This defence or protection does not just profit financial reasons. It as well strengthens ethical rights, like the privilege to be acknowledged as the owner and to avoid misutilisation or falsification of your work.

Why you should Protect Your Creations

Safeguarding your ideas aids:

- Recompense originality and exertion: You obtain credit for your intellectual involvement.
- Inspire invention: Creators are more liable to foster novel resolutions when they see their product is safe.
- Avoid piracy or misemployment: strangers cannot complain or vend your creation as their propriety.
- Guarantee moral and expert acknowledgement: Regarding IP demonstrates morality, truthfulness, and academic wisdom.

Students and experts in engineering field who do not succeed to guard an invention can cause debit of proprietorship, economical deficit, or moral issues in use or research.

Kinds of Intellectual Property Protection

Diverse forms of innovations necessitate dissimilar protecting systems. The key lawful means involve:

Commerce Secrets

Commerce secrets denote secret technical or business data which offers a firm a cuthroat benefit, like formulations, information, or procedures. To stay defended, this data has to be maintained confidential and just revealed under privacy contracts (Non-Disclosure Agreements, or NDAs).

Tips to Protect Your Work in the Real-world

Safeguarding your inventions includes jointly lawful acts, moral, and ethical conduct. What follows are the key actions:

Step one. Categorize your invention:

Establish what form of intellectual material you own: a creation, writing, a project, software, or a trademark plan.

Every kind of originality possesses a particular type of safeguarding and protection (copyright, brand, patent, etc.).

Step two: Hold Proof of Authorship

Keep evidence of invention, like timestamped versions, research pad, digital correspondence, or drafting folders. These deeds show your proprietorship if there is a disagreement or piracy.

Step three: Record Your Rights (if germane)

Certain rights, like copyrights and brands, necessitate formal registering at domestic or global agencies:

- Algeria:
 - For industrial designs, patents, and trademarks, there is INAPI (Institut National Algérien de la Propriété Industrielle).
 - For copyrights, there is ONDA (Office National des Droits d’Auteur et Droits Voisins) for copyrights.
- Globally:
 - WIPO (World Intellectual Property Organization) runs international organizations like the Madrid System for trademarks and PCT for patents.

Step Four: Employ visible ownership and quotations

Permanently indicate your work or plainly cite your forename as the creator. When employing other person’s notions, add correct quotations and resources to demonstrate regard and esteem for intellectual honesty.

Step five: Safeguard or watch over secrecy

In case your work includes subtle data, demand associates or teammates to sign confidentiality contract prior to distributing specificities. This is vital in research groups, innovation-driven firms, or business cooperations.

Ethical and Moral Elements of Protection

Defending and safeguarding your ideas is not just a lawful subject but it is as well an ethical duty. It shows integrity, justice, and regards toward your associates, partners, and the academic society. On the other hand, employing the idea of another person with no authorization or recognition involve piracy or intellectual stealing, such actions damage individual status and established reliability.

Furthermore, ethical defence and protection signifies employing your rights dutifully:

- Prevent recording patents or brands for immoral intentions.
- Share your work for public benefit when appropriate.

- Regard free-source authorizations and original shared requirements when utilising others' products.

Though maintaining equilibrium between duties and rights, you develop a culture of faith, justice, and cooperation in scientific and professional environments.

Particular Note for Civil Engineering Students

In practical domains such as civil engineering, preserving thoughts might apply to:

- Novel building materials or maintainable design approaches;
- Inventive analysis processes or gear;
- Online devices or software for designing and recreation;
- Research articles, dissertations, or innovation initiatives.

Learners are urged to:

- Record their design procedure cautiously;
- Converse possible preservation with superiors;
- Prevent unpermitted distribution of project information online prior to issuance or registering.

Grasping the ways to defend intellectual work trains students for upcoming professional life where originality and ethics go hand in hand.

2.4.3 What Happens If Someone Steals Your Work?

If someone else employs your academic property without your authorisation, such an act is named infringement or intellectual property theft. This involves:

- Plagiarism: To copy a study report or project without acknowledgement
- Patent infringement: To vend or utilise your creation without a license
- Employment of your plans or technical drafts in another project without permission

When such actions occur, the original inventor is allowed to file a claim or take lawful action. In Algeria, the IP holder has the possibility to:

- Send an official cautionary (*mise en demeure*) to the violator
- Recount the incident to INAPI or ONDA, relying on the kind of property
- File a court case and ask for fiscal reimbursement or a prohibition on other utilisation (Ordonnance 03-07, 2003)

All over the world, conventions such as the Berne Convention and TRIPS Agreement give protection and defence across frontiers for creators and authors (WTO, 2023). Nevertheless, the procedure may be multifaceted and overpriced, thus inventors are fortified and confident to defend their work at the beginning and maintain proof of authorship.

2.4.4 Means and Regulations for Protecting Intellectual Property

Protecting and safeguarding intellectual property (IP) is an essential element of ethical, moral, and expert behaviour in university, research, and invention. It guarantees that originators, creators, and academics obtain acknowledgement and defence for their innovative involvements. Comprehending the means and lawful charters accessible for IP preservation permits learners, teachers, and experts to control their innovation and technical results reliably.

Lawful Regimes of Intellectual Property

The preservation of intellectual property is managed jointly by state and universal regulations. These lawful frameworks describe what may be defended, how much time the protection carries on, and the privileges and duties of proprietors.

- Domestic Legislature (Algeria): Within Algeria, IP safeguarding is chiefly managed by the Algerian Office of Industrial Property (INAPI) and by domestic legislations on exclusive rights, innovation licences, and brand names. These regulations acknowledge the rights of writers, creators, and inventors, guaranteeing that their materials are safeguarded against unpermitted employment or recreation.
- Universal Agreements: A lot of nations, involving Algeria, are parts of global establishments and agreements namely:
 - WIPO (World Intellectual Property Organization): endorses international IP safeguarding and collaboration.
 - The Paris Convention (1883): Defend business property (on exclusive rights, innovation licences, and brand names, etc.) globally.
 - The Berne Convention (1886): Guards art and bookish works (volumes, music, schemes).
 - The TRIPS Agreement (1995): establishes universal criteria for IP preservation under the World Trade Organization (WTO).

Such legislations guarantee that inventors can safeguard their product both at domestic and international level, endorsing invention, creation, and financial advancement.

Major Means for Intellectual Property Preservation

Numerous tools and devices exist that persons and institutions may employ to safeguard and preserve their intellectual property, relying on the character of the invention or creation:

- Patents: Preserve novel innovations which are new, valuable, and non-recognizable. A patent offers the creator unique privileges to make, employ, or vend the creation for a regulated time (normally twenty years).
- Copyrights: Guards art and bookish works (volumes, music, schemes, software, plans). Copyrights provide inventors the right to manage the recreation, sharing, and adjustment of their product.

- Trademarks: Protect unique emblems, marks, logos, or symbols which recognize materials or services. A trademark aids found marks distinctiveness and avoid others from utilizing identical brands which can result in misperception.
- Industrial Designs: Preserve the artistic or ornamental features of an item, its form, design, or color, instead of its purpose.
- Trade Secrets: Safeguard secret business data, formulations, or procedures which provide a firm an economical gain (for instance, building formulations, material configurations, or exclusive software programmes).
- Licensing and Agreements: Permit inventors to lawfully distribute or market their creations while keeping proprietorship rights.

Each of these devices has as a particular objective and gives a dissimilar level of preservation, relying on the character of the invention.

The Role of Institutions and Experts

Higher education institutions, research institutes, and firms have significant functions in safeguarding intellectual property. They often have IP strategies, ethics boards, and lawful areas which direct scholars and learners in preserving their products.

Scholastic honesty and professional accountability necessitate that every writers, co-writers, creators, and engineer, be appropriately recognized and that proprietorship be plainly described via contracts or conventions.

Significance of Awareness and Ethical Utilisation

To be conscious of IP legislations and means or devices endorses a culture of regard, integrity, and originality. Misutilising or reproducing others' product with no permission is not just immoral but as well unlawful. Learners and academics must know to:

- Correctly quote and mention all references.
- Prevent piracy, theft, and information falsification.
- Record and safeguard their individual inventions or designs when required.
- Respect the rights of others in cooperative or experts environments.

2.4.5 Ways to Render Your Ideas Valued

A thought grows valuable when it is expanded, protected, and employed efficiently. For instance, a novel building method or green material may be transformed into:

- A licensed technology marketed to firms
- A start-up product which goes into the marketplace
- A study publication that obtained academic acknowledgement
- A patented innovation that may be distributed or marketed universally

To render your ideas valued:

1. Record them plainly with technical specifications and drafts
2. Defend them via suitable lawful means (patent, copyright, logos)
3. Publicise your work at seminars, contests, or via publications
4. Cooperate with research organisations or companies which can aid progress
5. Comprehend estimation: the more valuable, practical, original, sought-after, and high-demand your idea is, the more valued it grows to be

According to WIPO (2022), the commercialisation and valorisation of IP are essential for turning creativity into economic growth. Algerian universities and research institutes increasingly sustain students via Technology development programmes, Startup accelerators, and Innovation transfer centres (MESRS, 2021).

2.4.6 Intellectual Property Empowerment: Providing Worth to Your Ideas

Intellectual Property (IP) empowerment denotes the procedure of altering intellectual inventions into precious resources that produce communal, academic, or financial gains. Besides lawful defence, empowerment highlights the applied use and distribution of information, filing the hole between study, novelty, and communal growth. In Higher education institutions and research institutes, it characterizes an essential phase in the innovation pathway, guaranteeing that thoughts, creations, and findings add practical development.

Empowerment may hold manifold kinds, comprising market development, intellectual property rights, knowledge transfer, startup creations, institutional collaborations, and knowledge distribution. For example, an inventive blueprint in civil engineering can guide to the advancement of a novel building material that may then be copyrighted, authorized for use, or commercialized. Likewise, research findings in eco-friendly engineering may be exploited via cooperation with businesses administrative institutes to develop durability methods.

From a scientific standpoint, empowerment represents the source of information usefulness, the notion that academic work obtains sense and importance once it profits community. It strengthens the moral and ethical aspect of fieldwork through supporting originality with the civic welfare, guaranteeing that developments are not practised only for individual or formal profit but for wider public good.

To attain efficient empowerment, inventors must comprehend both the lawful and tactical features of IP managing. This involves recognizing what features of their product are preserved, safeguarding suitable privileges (such as copyrights, patents, or trademarks), and advancing a plain policy for utilisation, whether through market development, intellectual property rights, knowledge transfer, startup creation, institutional collaborations, and knowledge distribution. Institutes frequently sustain this procedure via knowledge transmission offices, development programmes, and novelty clusters that offer counselling in assessing creations, writing lawful contracts, and relating scholars with business inventors.

Within Algeria, instituts like the Institut National Algérien de la Propriété Industrielle (INAPI) and several university invention compartments have a major position in enabling IP empowerment. Their task involves helping academics in safeguarding and endorsing their creations, promoting cooperation between university and business, and inspires the making of innovative firms founded on domestically advanced technologies.

Furthermore, from a moral and ethical perspective, empowering intellectual property as well comprises guaranteeing that inventions are advanced reliably and inclusively, considering durability, availability, and regard for social privileges. For instance, the empowerment of investigation in durable energy or water managing must target not merely at gain but also at tackling ecological difficulties and enhancing communal welfare.

Finally, the empowerment of intellectual property alters creation and investigation into locomotives of financial development, technical invention, and individual growth. It represents the change from information making to information employment, connecting morals, invention, and accountability in a comprehensible background which supports both scientific quality and domestic growth.

Employing Ethical Decision Tools for Intellectual Property Problems

Intellectual property problems do not merely include lawful considerations; they also pose crucial ethical interrogations linked to justice, identification of intellectual endeavour, and societal accountability. Professionals and students often face situations in which lawful obedience may not completely tackle moral concerns. In such situations, ethical decision-making frameworks offer precious guidance for liable conduct.

The ethical frameworks presented in **Unit 1** may be successfully applied to IP situations in university, digital, and professional contexts.

A. Ethical Checklist for IP Choices

Prior to utilising, sharing, or recreating intellectual content, individuals are endorsed to reflect the following ethical queries:

- Is the content preserved by patent, copyright, or further intellectual property rights?
- Have the first authors or inventors been openly credited with correct reference?
- Does the employment of this content follow and obey academic honesty and professional integrity?
- Would this deed unfairly disadvantage the original inventor?
- Is the content utilised for instructive, professional, or trade reasons?
- Could this employment be ethically explained and defended, even if it looks technically allowable?

This checklist aids avoid plagiarism, misutilisation of digital sources, and involuntary infringements of IP rights.

B. Ethical Grid Applied to Intellectual Property Dilemmas

Ethical grids enable learners to compare various options linked to intellectual property utilisation and safeguarding.

Option	Official Compliance	Ethical Justice	Academic Honesty	Social Consequence
Utilising content without reference	No	No	Infringed	Negative
Utilising content with proper reference	Yes	Yes	Respected	Positive
Producing innovative content	Yes	Yes	Respected	Positive

Through visualising the ethical outcomes of all options, students can easily recognize the most liable way of action.

C. Application Instance: University and Civil Engineering Setting

Case **Instance:**
 A civil engineering student employs expert software and online technical designs that he found on the web to finish a project.

- The student should check if the software is open-source or licensed.
- The reference of the drawings must be openly mentioned.
- Alterations to existing drawings must be credited.

Using the ethical grid and checklist demonstrates that accountable utilisation of intellectual sources necessitates clarity, regard for authorship, and accordance with both lawful and ethical values.

D. Ethical Thinking on Protection and Novelty

Ethical decision-making tools also aid students thinking about the equilibrium between safeguarding intellectual property and endorsing novelty and information sharing. While safeguarding guarantees acknowledgement and financial worth, extreme limit may deter scientific advancement and societal growth.

Students are thus endorsed to take into account:

- how IP safeguarding may co-occur with ethical honesty;
- what is the role of free software and open-source in education and civil engineering;
- the ethical accountability of civil engineers to contribute to social development.

2.5 Creative Step

The creation must include an innovative step, signifying it has not to be clear to an individual with medium information in the domain. This standard differentiate genuine authentic from plain developments or dull alterations of current technologies.

For instance: Substituting a metal bolt with a plastic bolt in a current project is not deemed innovative except if the alteration makes an important and unforeseen technological profit (e.g., superior resistance, inferior mass, or budget decrease).

In a nutshell, an innovative step necessitates an original bound instead of a foreseeable change.

2.6 Industrial Utility

A creation needs to be utilized in industry, which signifies it needs to have useful appliance as well as practical utility. The innovation must work as defined and create a real technical outcome.

For instance: A novel building approach which permits rapid and secure assemblage of manufactured structures encounters the industrial appliance conditions, since it can be applied in civil engineering field.

Thoughts, notions, or entirely artistic inventions, nevertheless, cannot be protected as they do not possess absolute industrial utilisation.

Further lawful conditions: Additionally, the three key requirements mentioned earlier, patent agencies as well necessitate that innovations have particular official and ethical values:

- Plain Definition: The innovation must be defined in adequate specifics in order that any skilful individual in the domain is able to recreate it. This clearness permits technical information to spread.
- Agreement of Creation: A sole patent appliance must link to one creation or a collection of directly connected creations, not to manifold unconnected thoughts.
- Legal and Ethical Nature: Creations which infringe civic command, ethics, or ecological protection cannot be protected. For instance, technologies which produce pollution, damage person healthiness, or endorse unlawful activities are eliminated from patent.

What is not patentable? Particular themes are eliminated by regulations from patent safeguarding, even though they are novel or beneficial. These involve:

- Scientific innovations, mathematical hypothesis, or nonconcrete thoughts (as they fit in the community fields).
- Aesthetic inventions, like art, books, or melodic work (defended rather by *copyright*).

- Plans, regulations, or approaches for doing psychological performances, commercial managing, or performing games.
- PC programmes by itself (unless they create a new technical result).
- Creations opposite to morals, healthiness, or the ecology, like human genetic duplication or severe natal alterations.

Such rejections reveal the standard that not all that may be financed should be dominated or put in commerce.

Patentability in Algeria and universal procedure: The Algerian National Institute National of Industrial Propriety (INAPI) is in charge of inspecting patent appliances and controlling if a creation fulfils patentability conditions. INAPI assesses the technical, lawful, and moral features of every submission prior to allowing a patent.

Internationally, patentability is controlled via numerous contracts and agreements, involving:

- The Paris Convention for the Protection of Industrial Property (1883) guarantees similar dealings for external candidates;
- The Patent Cooperation Treaty (PCT) abridges universal patent filing via a united process;
- The Treaty on Trade-Related Aspects of Intellectual Property Rights (TRIPS) under the World Trade Organization (WTO) that regularises international IP criteria.

These bases smooth universal acknowledgement of patents while guaranteeing moral behaviour in invention and research.

Significance of patentability for students and academics: Regarding students in engineering, science, and technology fields, comprehending patentability aids:

- Differentiate between *thoughts* and *innovations* which can be lawfully patented;
- Grow consciousness of intellectual accountability in originality and invention;
- Avoid deception, piracy, or patent violation through regarding current rights;
- Promote a culture of novelty which lines up with moral, ethical, and maintainable standards.

For intance, student in Civil engineering, in the future create advanced building materials, structural prototypes, or digital devices. Grasping how to evaluate the patentability of their product will aid them safeguard their innovation while developing honesty and innovation.

Summary

Themes	Main Concepts
Protecting your thoughts	Employ patents, copyright, and logos; preserve and document your work
If someone steals it	This is a violation; lawful action can be taken locally or universally
Rendering ideas valuable	Foster, defend, distribute, and publicise ideas to transform them into practical and valued inventions.

Patent	Lawful right that protects innovations (products, techniques, systems)
Aim	Encourages innovation; offers full rights to creators
Algeria (INAPI)	Local patent office manages national patent requests
International Patents	Employ the PCT, EPO, or ARIPO to protect innovations in manifold nations

Industrial Property	protects creations, patents, logos, and design
Artistic Property	protects books, papers, music, software, and innovative work via copyright
Citation	Acknowledges the original authors when employing their ideas or words
Reasons for Citation	for keeping away from plagiarism, creating trust, and demonstrating academic responsibility

Component	Description
Context	IP problems include both lawful and ethical respect, involving equality, acknowledgement of authorship, and societal accountability. Ethical tools aid guide accountable choices beyond plain legal accordance.
Ethical Checklist	Questions to assess the ethical utilisation of content, like correct reference, regard for authors, prevention of plagiarism, and explanation of utilisation in educational or professional contexts.
Ethical Decision Grid	A comparative tool to examine choices for employing intellectual property, evaluating legal obedience, ethical justice, academic honesty, and societal impact.
Scenario Instance	A student utilising software or online drawings must verify licensing, mention references, and recognize alterations. Ethical devices guide accountable employment.
Reflection on Protection and Novelty	Students reflect on how protecting IP can co-occur with information sharing, open-source utilisation, and social development, strengthens ethical accountability.
Pedagogical Involvement	Links legal information with ethical liability, reinforces consciousness of academic integrity and professional honesty, and trains students for practical IP dilemmas.

Unit 3: Ethics, Technology, and Sustainable Development

In this part, students will learn:

- ✓ How **novel technologies** (such as smart tools, Artificial Intelligence) influence **integrity and accountability**.
- ✓ The significance of **sustainable development** in civil engineering (e.g., preserving the environment, employing eco-friendly resources).
- ✓ Engineers should make **ethical decisions** by taking into account the community, the environment, and future generations.
- ✓ The worth of **data confidentiality, digital security, and respect for the planet**.
- ✓ How to keep equilibrium between technology, financial objectives, and ecological care in real-life projects.
- ✓ Use eco-friendly and green practices.
- ✓ Utilize Artificial Intelligence, drones, and technology liably.
- ✓ Respect human/ecological rights and bioethics.
- ✓ Obey regulations, principles, and professional accountability.

Evaluation Methods

The evaluation of Unit 3 is founded on **continuous assessment**, intending to evaluate students' capacity to analytically examine the ethical repercussions of sustainability, technology, and decision-making in civil engineering environments.

Evaluation involves the following:

- **Class interaction and oral discussion**
(debates and answering questions related to AI, ethics, technology, and sustainability)
- **Scenario case analysis**
(individual or team analysis of ethical dilemmas including technology utilisation, ecological protection, secrecy, and sustainable development)
- **Written exercises and analytical thinking**
(ethical analysis, explanation of accountable decisions, and considering future career responsibilities)
- **Quizzes and tests**
(Quizzes, true/false exercises, matching tests, and vocabulary exercises related to ethics, AI, and durability)
- **Reading comprehension exercises**
(analyzing texts linked to ethical engineering, technological risks, and durable development)
- **Project work and presentations**
(Oral presentations about ethics, AI, sustainability, or green engineering solutions)
- **Analytical writing**
(writing short essays concentrating on accountable decision-making, ecological ethics, and professional responsibility)

Unit 3: Ethics, Technology, and Sustainable Development

3.1 Ethics, Technology, and Sustainable Development

Nowadays, engineers are not just constructors and creators, but also policy-makers who are asked to consider the principled and proper results of their deeds on both people and the environment. With the rapid development of novel technologies like artificial intelligence (AI) and the rising menace of temperature change, learners and professionals must take steps ethically, morally, and eco-consciously. Civil engineers, especially, are in charge of creating constructions and schemes which serve the community securely, justly, and dutifully (UNESCO, 2021).

3.1.1 The Relation between Ethics and Ecological Accountability

The connection between ethics and ecological accountability remains at the center of durable advancement. Ethics offers the ethical and moral foundation which directs individual conduct and choice management, as ecological accountability converts these moral standards into real acts which preserve the earth. Within the domain of civil engineering, in which engineers actions straightly affects environmental reserves, nature, and upcoming generations, comprehending this relationship is vital for liable processes.

Ethical Basics of Ecological Accountability

Ethics in ecological backgrounds allude to the ethical standards which control the way individuals must cooperate with the environment. It comprises notions like respect for the environment, fairness among generations, and accountability for environmental equilibrium. Ecological ethics demands basic interrogations like:

- What are the ethical responsibilities that we must have toward nature?
- How should we maintain equilibrium between financial advancement and environmental protection?
- Who is responsible for ecological damage?

Such interrogations aid to forming liable behaviour toward reserves managing, toxic waste control, and durable building techniques.

From Ethical Basics to Ecological Action

Ecological accountability alters ethical and moral thinking into real-world conduct. It includes selecting rational choices to reduce harmful ecological effects and to endorse durable methods. In scientific and expert settings, this signifies:

- Decreasing toxic waste, energy depletion, and releases.
- Employing green materials and techniques.

- Respecting ecological regulations and rules.
- Endorsing reprocessing and accountable waste managing.
- Incorporating durability into engineering project and development.

Scholars, civil engineers, and students have to take into account the long-standing impacts of their acts, guaranteeing that current development does not delete the welfare of upcoming generations.

The Position of Ethics in Durable Development

The United Nations described durable development like the growth which convenes the necessities of today without undermining the capacity of upcoming generations to touch their individual requirements. Ethics offers sense and way to this target by inspiring persons and institutes to proceed not merely as said by what technologically is achievable or financially beneficial, but also consistent with what is ethically correct. Moral thinking aids engineers and leaders assess the communal and ecological results of their projects, like:

- City growth and land utilisation.
- Substructure advancement and energy depletion.
- Water and reserve managing.
- Waste management and ecological rehabilitation.

Through moral logic, experts can select techniques which respect both individuals and environmental necessities.

Experts and Institutional Duties

Ecological accountability is not merely a private subject but also a cooperative and official responsibility. Colleges, firms, and administrations have the moral, ethical, and lawful duty to realise ecological managing methods, embrace eco-friendly strategies, and inspire ecological balance instruction.

In the field of civil engineering, professional programmes of ethics highlight that engineers must:

- Safeguard civic healthiness, protection, and well-being.
- Diminish ecological harm.
- Employ reserves effectively and reliably.
- Encourage durable growth originality in materials and building practices.

This collective accountability guarantees that ethical standards are incorporated at each phase of structuring, conception, and execution.

The Ethical Aspect of Engineering Methods

Civil engineering choices are seldom detached, they comprise commerce-offs between price, effectiveness, and ecological effects. Ethical and moral consciousnesses allow civil engineers to consider analytically these decisions and to proceed with honesty. For instance:

- Selecting materials which decrease carbon releases even if they are more expensive.
- Planning projects which protect the environment.
- Declining to take part in activities that are damaging for ecosystems.

These choices show an ethical engagement to the collective welfare and to the universal welfare.

3.1.2 Energy Efficiency and Ecosystems Ethics

Nowadays, energy efficiency has grown to be among the most significant obstacles connecting morals, ethics, engineering, and eco-friendly advancement. While communities endure universal heating or warming, reduction of natural reserves, and ecological deterioration, ethical and moral thinking is vital to direct liable energy utilisation and invention. Energy efficiency is not only a technological or financial problem; it is an ethical and moral duty toward today and upcoming generations. It comprises selecting rational choices regarding the way energy is created, shared, and employed while reducing damage to the earth and guaranteeing civic fairness.

Comprehending Energy Efficiency in an Ethical Framework

Energy efficiency denotes attaining the equivalent or enhanced findings while utilising a smaller amount of energy. In other terms, it concerns decreasing waste, improving procedures, and increasing execution with the least ecological effect. From a moral and ethical standpoint, this notion is connected to three main ethical standards:

- **Accountability:** Civil engineers and civilians must proceed liably toward natural reserves, guaranteeing their protection for upcoming generations.
- **Fairness and impartiality:** Energy reserves have to be employed justly in order that emerging nations and weak populaces as well have approach to unsoiled energy.
- **Environmental friendly decisions:** Choices must maintain equilibrium between current necessities and long-standing ecological preservation.

Embracing energy-efficient practices in civil engineering and infrastructures planning shows professional moral and ethics through uniting invention with ecological regard.

Energy Conservation in Civil Engineering Practices

Energy conservation is used at every step of conception, building, and maintenance. Some instances comprise:

- **Resource efficient construction conception:** Employing isolation, inert airing, and natural illumination to decrease warming and cooling necessities.

- Material choice: Selecting nearby accessible, reprocessed, or minimal-carbon materials to decrease the project's general energy footprint.
- Intelligent infrastructure: Using devices and smart techniques to supervise energy employment and increase execution.
- Transportation and resources management: Decreasing petroleum depletion via effective building machines, electrical means of transportation, or enhanced roads.
- Sustainable energy incorporation: Employing renewable energy such as: wind generators, solar plates, or geothermal installations to operate civic constructions and building places.

Every phase of such actions mirrors ethical and moral civil engineering behaviour, in which the target is not merely to finish a project effectively but in addition to preserve the ecology and individuals welfare.

The Ethical Features of Energy Utilisation

Energy-connected choices frequently include ethical dilemmas which surpasses technological computation. Ethical and moral thinking aids assess the how and why behind such choices:

1. Ethical Accountability: civil Engineers and technologists have an obligation to plan systems which reduce wasted energy and decrease releases. Ignoring preservation may guide to pollution, reserves diminution, and long-standing environmental damage.
2. Cross-generational Fairness: Employing energy incompetently or wastefully currently reduces the reserves and chances accessible to upcoming generations. Moral and ethical durability necessitates anticipation and moderation.
3. Communal and Organizational Ethics: Institutions have to embrace clear strategies endorsing spotless techniques, accountable purchasing, and eco-friendly responsibility.
4. Universal Morals and Ethics: Industrialized nations must sustain energy-efficient techniques and durable energy admission in emerging countries to endorse environment fairness and communal equilibrium.

Ethical and moral energy utilisation thus embodies regard and respect for individual dignity and environmental limits, two fundamental values of ecological ethics.

Ecological Morality and Environmental Consciousness

Ecological morality examines the ethics connection between human beings and the environment. It demands interrogations like:

- What are the duties that human beings have toward the earth?
- How would financial development maintain equilibrium with environmental protection?
- Do living things (plants, animals) have ethics privileges?

Major principles in ecological ethics comprise:

- Regard for existence: Identifying the inherent principle of every living thing.
- Guardianship: Being responsible protectors of the planet reserves, not abusers.
- Reasonableness: Preventing overutilisation and needless excess.

- Durability: Making sure that individuals' actions stay within environmental restraints.

Utilising ecological morals and ethics to civil engineering signifies incorporating such principles into all choices, starting from picking materials of construction to controlling energy resources and by-products.

Ethical Devices and Universal Guides

Numerous global policies and programmes sustain ethical thinking and activities on energy resources and ecological accountability:

- The United Nations Sustainable Development Goals: Endorse inexpensive and spotless energy resources, and insistent accomplishment against wheather transformation.
- The Paris Agreement (2015): Requests for international collaboration to control earth temperature increase and diminish greenhouse smoke releases.
- ISO 14001 Environmental Management Systems: Gives guides for durable manufacturing and building techniques.
- Corporate Social Responsibility (CSR): Incites industries to incorporate energy resources and ecological morals and ethics into their central principles and writing.

Through siding with such values, civil engineers show both expert honesty and international social responsibility.

The Responsibility of Teaching and Ethical Mindfulness

Teaching students and experts on energy resources ethics is vital. Academic world and technological institutes must:

- Incorporate energy-saving subjects into civil engineering programmes.
- Promote project-oriented learning which studies durable building and eco-friendly inventions.
- Foster moral analysis abilities to study the ethical effect of energy-connected choices.
- Endorse cross-disciplinary cooperation between civil engineers, economic experts, and ecologists.

Developing ethical consciousness guarantees that upcoming experts plan with integrity, capability, and protect the ecosystem.

Energy Conservation in Civil Engineering Works

Realistic instances of energy-mindful ethics decisions in civil engineering involve:

Appliance	Ethical Advantage	Practical Instance
Construction isolation	decreases energy by-products and releases	Paired-glazed casement, green isolation
Durable energy incorporation	Endorse sustainable growth and justice	Sun panels, tiny wind power generators

Appliance	Ethical Advantage	Practical Instance
Intelligent illumination systems	Keep power and civic reserves	Light Emitting Diode with signals sensors
Minimal-effect materials	Decreases carbon Ecological impact	Reprocessed concrete, eco-friendly cement
Durable water networks	Preserves sources	Water reuse systems, Sustainable pumping technologies

Ethical and moral analysis aids civil engineers assess not merely the price but the morality behind every conception decision.

Towards a Principle and Ethic of Durable Energy Saving

Energy conservation mirrors a wider ethical reflection, among such principles plainness, balance, and shared accountability. Deciding to guard energy is a kind of ethical act, showing regard for the planet and human beings.

Growing a culture of moral durability needs:

- Civic strategies which recompense effectiveness and fine by-products.
- Integrate clarity in energy saving reporting.
- Society involvement in preservation inventiveness.
- Individual accountability in everyday energy saving conduct.

Energy saving morality and ethics therefore unifies persons, organizational, and international endeavours toward a more equalized and empathetic globe.

3.1.3 The Significance of Sustainable Development in Civil Engineering

Sustainability signifies meeting the requirements of today's community without undermining the capacity of the upcoming generations to meet theirs. In civil engineering, this includes designing and constructing projects which are financially effective, publicly accountable, and ecologically green (Brundtland Report, 1987).

Civil engineers have a key position in forming the physical environment. From constructions to bridges, to transport systems, their decisions directly influence natural reserves, energy employment, and pollution ranks. Consequently, engineering solutions are expected to decrease:

- Leftover production
- Water and energy use
- Carbon emanations

For instance, utilising reprocessed materials, inventing for energy efficiency, and scheming for environmental resilience are all sustainable procedures. As per the Algerian National Strategy for

Environment and Sustainable Development (2020–2035), which encourages universities and technical institutions to include eco-friendly engineering systems in their programmes?

Furthermore, sustainability is not just a climate apprehension; it is a moral responsibility. Engineers are expected to make sure their projects do not damage societies or ecosystems, but rather add to durable or lasting welfare and fairness (UNESCO, 2017).

3.1.4 Making Responsible Decisions for the Future

Ethical and sustainable decision-making necessitates engineers to explore beyond technical resolutions and take into account community, ecological, and upcoming effects. This is particularly significant in a world encountering global warming, resource shortage, and communal disparity.

How to make responsible decisions:

- Professionals and Students are expected to be updated regarding ecological laws, universal values, and ethical rules.
- Engineers must respect codes like the UNESCO Engineering Ethics Principles or the Algerian Code of Ethics published by the Ministry of Higher Education and Scientific Research (MESRS, 2020).
- Civil engineering choices need to take into consideration national society requirements, cultural standards, and upcoming generations.

Responsible engineers need to:

- Employ sustainable technologies
- Give priority to security and availability
- Prevent unethical and immoral practices
- Encourage research and invention

As per the United Nations Sustainable Development Goals (SDGs), engineers are the basis to attain objectives such as sanitary water (Objective 6), sustainable towns (Objective 11), and climate action (Objective 13). Therefore, moral, ethical, and sustainable engineering is not elective; it is the accountability of people and the globe (UN, 2015).

3.1.5 Ethical Decision-Making Tools for Technological and Sustainable Challenges

Within the domains of technology, civil engineering, and sustainable advancement, professionals frequently face multifaceted situations including conflicting principles, like financial profit, ecological protection, community security, and civic responsibility. In these settings, ethical decision-making cannot depend only on instinct. Real-world devices are thus crucial to guide accountable decisions.

This part presents plain ethical decision-making tools that assist learners analyse multifaceted scenarios and make knowledgeable, moral, and sustainable choices.

A. Ethical Decision-Making Checklist

Prior to making a decision, students and professionals ask the following queries:

- Does this choice fulfil ethical standards such as honesty, responsibility, and impartiality?
- Does this decision align with ecological protection and sustainable progress aims?
- Would it harm people, environment, or future generations?
- Is the choice lawfully tolerable and communally responsible?
- Is every participant (users, society, ecology, institutions) taken into consideration?

Such checklist aids to recognize possible ethical dangers and inspires responsible reflection before action.

B. Ethical Decision Grid: Analysis Based on Value

Ethical dilemmas frequently include a struggle between various standards. An ethical decision grid permits the analysis of potential decisions through comparing their effect on main ethical aspects.

Decision Option	Ecological Effect	Societal Effect	Financial Effect	Ethical Adequacy
Option A	Low / Medium / High	Positive / Negative	High Cost	Adequate / Doubtful
Option B	Low / Medium / High	Positive / Negative	Moderate Cost	More Ethical

This grid allows students to envisage the impacts of all options and to explain their choices reasonably.

C. Application Instance in Civil Engineering Context

Scenario Instance:

A civil engineering group of students must pick either a cheap construction material that harms the environment or a sustainable material that is more costly.

Utilising the ethical grid and checklist:

- The ecological consequence of the initial choice is negative.
- The sustainable choice protects better environments and civic health.
- Even though more costly, the sustainable choice complies with ethical accountability and long-term growth objectives.

Thus, the ethical decision chooses sustainability over short-term financial profit.

D. Ethical Analytical Thinking Questions

To finish the analysis, students are fostered to think about the following queries:

- What ethical standards are in conflict in this case?
- Which option best defends human welfare and the ecology?

- How could technology be employed liably to sustain sustainable growth?

Sum up

Key Field	Description
Technology and Ethics	Employment of AI, information, and the Internet is expected to respect confidentiality, clarity, and impartiality.
Sustainability Engineering	in Civil engineers need to design ecologically green, effective, and communally accountable projects.
Responsible Choices	Decision-makers have to care about upcoming effects, lawful frameworks, and community equality.

Component	Description
Settings	Technology, Civil engineering, and sustainability comprise intricate choices with conflicting standards (financial, ecological, societal). Ethical tools aid direct responsible decisions.
Ethical Checklist	Queries to assess choices: aligns with honesty, justice, ecosystem defence, lawful/communal responsibility, and participants consideration.
Ethical Decision Grid	Compares choices by ecological, societal, economic consequence, and moral tolerability, aiding to visualise impacts and explain choices.
Scenario Instance	Picking a low-cost, ecologically damaging material and a sustainable, pricier option; ethical decisions prefer long-lasting sustainability over temporary profit.
Analytical Reflection Questions	Students analyse conflicting standards, best decisions for human and ecosystem welfare, and accountable technology utilisation.

3.2 Bioethics and Scientific Development

The fast development of technology and science in the current time has resulted in marvellous advantages to humankind, novel medications, genetic modification, artificial intelligence and smart robotics. Nevertheless, such advancement additionally augment multifaceted ethical and moral interrogations regarding how far human beings must go in controlling lifecycle and the environment. Bioethics is the domain which studies such interrogations, directing academics, decision-makers, and civilians to choose accountable and humanitarian choices that respect both individuals' dignity and the surrounding environment.

Academic advancement should thus be well-adjusted by principled analysis, guaranteeing that invention assists humankind instead of damaging it.

3.2.1 The Meaning of Bioethics in Current Science

Bioethics is a topic of practical morals which examines ethical problems connected to existence (bios) and individuals' activities (ethos). It tackles interrogations which result from medicinal, organic, and technical development, particularly those affecting persons' wellbeing, genetics, recreation, and ecological preservation.

In contemporary discipline, bioethics functions like an ethical scope, aiding academics differentiate between what may be accomplished and what must be achieved.

Central Standards of Bioethics

Most universal bioethical guidelines, comprising those founded by the World Health Organization (WHO) and UNESCO, are made around four major values:

1. Independence: Respecting persons' rights to take knowledgeable decisions regarding their bodies and involvement in investigation.
2. Profit: Proceeding for the profit of others through endorsing welfare and avoiding damage.
3. No harm: Keeping away from activities that can provoke bodily, mental, or ecological destruction.
4. Fairness: Making justice in the division of profits and drains of scientific development, and avoiding favouritism or misuse.

Such values direct choices in subtle places like organ gift, genetic alteration, genetic duplication, stem therapy study, and medical AI.

Bioethics in the Background of Technology and Civil Engineering

Even though bioethics is frequently connected to medical science, its significance spreads to the whole scientific domains, involving civil engineering, ecological disciplines, and computing. For example:

- Civil engineers must evaluate how building design effect human healthiness and ecologies.
- Artificial Intelligence inventors have to guarantee that procedures employed in civil engineering projects respect confidentiality, clarity, and justice.
- Ecologists have to preserve biological variety and humankind safety while presenting technical invention.

Therefore, bioethics inspires experts in all fields to incorporate ethical analysis into technical activities.

3.2.2 Ethical and Moral Challenges in Biotechnology and Human Studies

Biotechnology is the employment of flora and fauna and ecological networks to cultivate novel materials and techniques, gives strong devices in order to enhance human's existence. It involves genetic modification, genetic duplication, cell therapy study, and pharmacological research. However, such developments as well pose major moral dilemmas.

Human Dignity and Genetic Modification

The capacity to transform humankind DNAs presents profound ethical and communal apprehensions. While biotechnological treatment may avoid or heal grave illnesses, it furthermore unlocks the entrance to genetically modified babies or genetic improvement for non-medicinal reasons. Bioethics asserts that human being existence must never be reduced to a means of production or exploited for business or biased purposes. Any interference in humankind genetics has to regard self-respect, justice, integrity, and honesty.

Voluntary Agreement and Research Ethics

In individual research, voluntary agreement is an essential principled necessity. Contestants must completely comprehend the reason, dangers, and possible findings of study prior to participating. Academics are accountable for preserving contestants' secrecy, discretion, and security. Ethical research committees assess reports to guarantee conformity with these standards and avoid misuse.

Biotechnology and Ecological Effect

Biotechnological inventions, like species altered by biotechnology, bioenergy sources, and artificial biology, may profit farming and manufacturing but can as well disturb ecology or menace biodiversity.

Moral choices necessitate considering the advantages of inventions against possible long-standing ecosystems hazards. Accountable utilisation of biotechnology should lines up with the standards of durability and protection.

Fairness and Access to Scientific Advantages

Academic advancement must profit every individual, not merely an advantaged few. Ethical and moral backgrounds highlight international fairness, guaranteeing that growing countries have unbiased access to inoculations, equipments, and study results. Immoral and unethical methods like biotheft, the misuse of natural reserves, or conventional information without impartial recompense, infringe both moral and lawful principles of scientific collaboration.

Artificial Intelligence and Human Study

The increase of artificial intelligence and information-based study presents novel ethical difficulties:

- How can academics control subtle private information?
- Can machineries pick moral choices in medicinal or civil engineering settings?
- Providing that algorithms result in damage or unfairness, who is the first responsible?

Bioethics requires responsibility, clarity, and individual supervision in the whole AI-driven practices, guaranteeing that technology stays under moral and communal power.

3.3 Technology, AI, and Human Values

Within the current era, technology has turned to be indivisible from human development. AI, mechanization, computing, and online systems progressively form the methods person acquire, work, and exchange. Such revolutions have produced unparalleled chance for growth, effectiveness, and resolution of issues through instruction, exploration, and engineering. Nevertheless, they in addition pose novel ethical and principled difficulties which interrogate the way individuals should invent, manage, and utilise these technologies accountably.

The connections between technology and individual principles are situated at the center of contemporary moral and ethical consideration. Technological development should not merely serve invention and production but also support fundamental individual values like truthfulness, integrity, responsibility, confidentiality, fairness, and regard for human self-respect. Lacking moral and ethical leadership, the similar technologies which offer power to humans may in addition increase unfairness, threaten confidentiality, and societal equity.

This part investigates the way developed technologies, especially AI, automation, and drones, impact ethical and moral decision-making and individual behaviour in scientific, career, and civil engineering settings. It examines together the possible advantages of these devices (effectiveness, precision, durability, and invention) and their related ethical and moral dangers (misutilisation, injustice, supervision, and ecological effect).

In due course, the objective is to endorse an ethical and principled culture of technology, in which engineers, learners, and experts deed not just as clients of smart systems but like accountable inventors and keepers of technologies which uphold human well-being, societal fairness, and durable advancement.

3.1.1 How Novel Technologies (AI, Internet, etc.) Influence Integrity and Accountability

Contemporary technologies such as artificial intelligence (AI), big data, machine learning, and the internet have altered the way we learn, function, and construct. Nonetheless, they also increase novel ethical worries connected to confidentiality, accountability, equality, and safety.

For instance, AI may be utilised to design constructions, simulate circulation movements, or supervise building projects. However, if the information employed in AI styles is prejudiced or misapplied, it may lead to unjust results or confidentiality breaches (Floridi et al., 2018). In the same way, civil engineers who employ drones or numerical observation devices are expected to respect data protection laws and make sure that their utilisation does not infringe citizens' rights.

Moreover, the internet has rendered it simpler to gain access to information and share data, but it also augments the danger of plagiarism, propaganda, and digital crimes. Ethical numerical conduct involves respecting copyrights, defending internet-based identities, and preventing the dissemination of information.

As said by the European Commission (2020), ethical digital practices must be guided by the principles of transparency, accountability, and human dignity. For students, this means using technology for learning and innovation while respecting others' rights and protecting the integrity of information.

3.3.2 Ethical Utilisation of AI

The rising utilisation of Artificial Intelligence has changed to some extent all features of contemporary existence, from teaching, healthcare, and interaction to building, civil engineering, and academic study.

AI gives unparalleled chances for invention, effectiveness, and resolutions of problems. Nevertheless, these advantages pose severe moral interrogations regarding confidentiality, accountability, clarity, and the possible misutilisation of smart practices.

This part searches the ethical standards which must direct the accountable advancement and employment of AI in university, investigation, and business.

Comprehending AI and Its Ethical Setting

Artificial Intelligence denotes processor systems or gears which can execute assignments which usually need human being aptitudes, like cognitive, studying, scheming, and insight. In university and civil engineering context, AI means is able to:

- Help in information examination and modeling.
- Mechanize plans and model procedures.
- Sustain studying and investigation via smart teaching systems.
- Enhance energy and reserve managing in green building.

Even though such benefits and gains exist, the ethical utilisation of AI relies on the way it is intended, instructed, and employed. Immoral or free AI may recreate human unfairness, invade confidentiality, or substitute individual reasoning with unclear processes.

Ethical and Moral Standards in Artificial Intelligence

To guarantee liable utilisation, AI systems must be guided by clear ethical principles extensively identified in scientific and professional settings:

1. Clarity: AI choices and procedures need to be comprehensible and explicable. Users must understand how an algorithm creates findings.
2. Responsibility: Individual accountability need to always stay vital. Creators and consumers need to hold accountability for AI choices and their results.

3. Justice and Non-Favouritism: AI must not recreate societal, sex, or ethnic partiality available in its preparation information. Moral AI tools have to behave towards each person with justice.
4. Confidentiality and Information Preservation: AI needs to preserve subtle individual and organizational information. Information gathering and utilisation must regard agreement and privacy.
5. Individual's Control: AI must help, not substitute, human being decision. Individuals must manage concluding choices, particularly in security-analytical domains such as civil engineering or medicinal fields.

These standards guarantee that AI tools assist humans instead of controlling them.

Ethical Hazards and AI Challenges

AI tools can produce unintentional outcomes providing that ethical protection does not exist. Among the most significant apprehensions involve:

- Prejudice and Unfairness: Algorithms coached on unfair information may create bias or prejudiced consequences in employing, admittance, or functioning assessment.
- Secrecy Infringements: Facial identification, information chasing, and observation means can compromise individual confidentiality.
- Harm of Individual dependency: Dependency on AI can decrease individual accountability and ethical thinking in taking decisions.
- Academic Misutilisation: In academia, AI systems like article creators or translation tool can guide to piracy, deceitfulness, or shallow education.
- Work Movement: Mechanization can substitute human work in some domains, posing interrogations concerning societal and financial fairness.

Analytical morality or ethics is thus vital to maintain an equilibrium invention with accountability.

About AI Ethics in Research and University

Within research, AI may assist examine enormous datasets, identify designs, and hasten innovation. Nevertheless, academics must regard moral principles parallel to the standards in human research:

- Quoting AI-production content correctly.
- Preventing information control or fake findings via algorithmic prejudice.
- Regarding intellectual property, information propriety rights, and copyright.
- Employing AI devices (such language patterns or picture producers) with clarity and scientific honesty.

Academia is currently incorporating AI literatness and ethics into their programme to train learners for the digital time to come at the same time keeping the standards of honesty, justice, and truthfulness.

AI and Civil Engineering

Within civil engineering and technological fields, AI donates more intelligent patterns, prognostic upholding, and maintainable structure. However, civil engineers must use ethical reflection when:

- Utilising AI patterns for community security schemes.
- Planning independent tools like building robots, machine, and drones.
- Controlling ecological or private information gathered by sensors and intelligent devices.

AI Ethical or moral civil engineering necessitates cautious decision, incessant control, and respect for individual good and ecological effect.

Accountable AI Culture

Constructing an ethical AI awareness needs cooperation among teachers, civil engineers, decision-makers, and civilian. Therefore, essential actions comprise:

- Endorsing ethical knowledge and consciousness in AI education and practising.
- Founding organisational strategies for liable AI employment.
- Promoting clarity and responsibility in AI research.
- Guaranteeing inclusivity and civic involvement in AI-connected choices.

AI must be advanced for person development and communal welfare, not for misuse or control. Ethical thinking need to be present at all phases of technological invention.

3.3.3 Ethical and Moral Questions around Robotics and Automation

The appearance of automation as well as robotics embodies among the most extraordinary alterations of the 21st century. Robots grow to be progressively existing in businesses, laboratories, clinics, and much in houses. Automation tools currently do missions that previously necessitated human ability, decision, or originality.

While such technologies give unparalleled openings for inventions, production, and security, they additionally pose multifaceted ethical interrogations which defy conventional ideas of accountability, job, and individual self-respect. Comprehending and grasping such problems is vital for all experts who take part with technology and for learners training to access a progressively automatic life or universe.

The Definition of Robotics and Automation

Robotics is the discipline and engineering of conceiving, fabricating, and managing machinaries adept of achieving bodily missions independently or semi-independently. Automation, on the flip side, denotes tools or procedures which function with the least human interference, frequently managed by AI, devices, and computer systems.

Both robotics and automation aspire to enhance effectively, exactness, and security in domains like:

- Civil engineering: Drones, automatic building machines, and 3D printing.
- Production: Industrialized robots for assemblage or assessment.
- Medicinal field: Medical and operating robots and analytical devices.
- Transport: Free-driver means of transportation and circulation systems.
- Energy and farming: Robotic checking of harvests and sustainable tools.

Nonetheless, because machineries grow to be smarter and more independent, the string between human beings and machineries duty turns to be less transparent, producing novel ethical and moral dilemmas.

The Ethical basis of Robotics

Analytical ethics on robotics is based in numerous principled and thoughtful standards:

1. Human Accountability: All robotic tools are made, encoded, and used by humans. Hence, fundamental and eventual accountability for its deeds remains with its creators, producers, and consumers.
2. Benefits: Robots must be created to endorse human well-being that is to say to help, defend, and improve worth of life instead of damage or substitute humankind.
3. Non-Harm: Just as in medicinal field, robots must not harm or damage. They must be tried, examined, managed, and controlled to avoid mishaps, misutilisation, or unintentional harm.
4. Independence and Management: Humans need to keep concluding choice power, guaranteeing that machineries stay instruments, not autonomous ethical means.
5. Fairness and Parity: The advantages of automation and robotics must be distributed equitably, avoiding societal unfairness or work exclusion.

Ethical and moral robotics is therefore not merely a technological matter but a principled accountability assumed by civil engineers, decision-makers, and community in general.

Human Uniqueness and the Worth of Work

Among the deepest moral and ethical interrogations are about the effect of automation on individual work and self-esteem. Automation may substitute recurring or unsafe activities, enhancing security and production. Nevertheless, it may as well guide to:

- Waste of work and financial unfairness.
- Eliminating of the labour force.
- A rising sensitive and societal space between humans and their jobs.

From a moral and ethical perspective, technology should serve individual advancement, not decrease humans to outmoded elements of an automatic system. Educational institutes and workers hold an ethical responsibility to assist employers familiarize to mechanization through offering preparation, digital education, and novel chances for significant occupation.

Robots must improve individual capacity, not substitute the human beings sense of reason and creation.

Liability, Security, and Responsibility

When independent robots take choices, like free drivers' vehicles or building drones, controlling who is responsible or guilty for crashes or damage becomes complicated. Interrogations ascend such as:

- Is the creator responsible for the robot's software design?
- Are the consumers liable for inspecting its processes?
- Must the robot itself be identified as an ethical or lawful agent?

Most moral and ethical recommendations maintain that human being should as rule stay responsible for the conduct of machinaries. Principled design needs clarity, traceability, and surveillance systems which guarantee security process and avoid damage.

In civil engineering as well as industrial settings, this includes:

- Consistent and methodical examination and security authorisations.
- Plain operative processes and human overrule procedures.
- Constant checking for defects or irregular conduct.

Confidentiality, Observation, and Human Rights

A lot of robotic and automatic devices gather, treat, and stock big quantities of information, pictures, vocal sounds, motions, and even biological identification data. These skills pose and rise ethical, moral, and lawful worries regarding confidentiality, observation, and agreement.

Instances involve:

- Drones supervising building places or municipal spots.
- Robots with embeded cameras or devices working in offices or houses.
- AI-powered agents gathering private information.

Ethical utilisation of robotics should thus comprise:

- Respect for confidentiality and information safeguarding laws.
- Notified accord from persons whose information is gathered.
- Restrictions on observation and information imparting.

Robotic inventions must under no circumstances originate at the detriment of human liberty or self-respect.

Army and Safety Robotics

The growth of independent arms and army drones embodies among the most contentious areas within robotics morals. Robots able of choosing and assault goals without human interference rise severe and grave ethics interrogations:

- Can a machine comprehend ethics accountability or empathy?
- Who is responsible for citizen's loss produced by systems?
- Would there be a universal prohibition on assassin robots?

Universal unions, comprising the United Nations, have demanded for ethical and moral restrictions and international laws on deadly independent arms. The directing value is that existence-and-demise choices must for no reason be allotted to robots.

Affecting and Community Consequences

Contemporary robots or machines are progressively intended and invented to act together with individuals, in schooling, health, and client service. While societal robots may offer company or help, they can as well produce affective reliance, distort community limits, or change individuals' relations. Ethically and morally, community must interrogate:

- How must humans connect to robots which copy compassion?
- Can affective linking to robots decrease authentic human relation?
- Must robots be given privileges or considered as acquaintances?

The ethical and moral response is in keeping consciousness that robots, even though refined, stay devices with no consciousness or ethics sense.

Ecological and Eco-Friendly Dimensions

Automatic and robotic systems can donate to durability advancement via energy-efficient techniques, accurate engineering, and by-products decrease. Nevertheless, creating and keeping robots as well spends resources, vigour, and automated constituents which can damage the ecosystem if not controlled accountably. Ethical and moral design thus necessitates:

- Eco-friendly manufacture.
- Reprocessing and e-waste managing.
- Decreasing the environmental footprint of automatic manufacturing.

Eco-friendly robotics incorporates technological invention with environmental morals, guaranteeing that development profits together humankind and the earth.

The Role of Ethics Education and Laws

To guarantee liable employment of robotics, ethical and moral standards need to be incorporated into learning, expert guidance, and lawful charters.

Academia and research institutes have a key role in guiding engineers of tomorrow and technologists to:

- Identify the ethical implications of their inventions.
- Employ moral analysis in design and application.
- Respect and obey professional policies of behaviour and universal values.

Administrations and universal organizations must as well found:

- Laws for security, clarity, and responsibility.
- Ethical boards to study and evaluate elevated-danger robotics schemes.
- Civic discourse to align invention with social principles.

Ethical and moral robotics do not mean the lack of technology, but the accountable supremacy of technology.

3.3.4 Ethics and the Utilisation of Drones in Civil Engineering and Scientific Settings

The fast dispersion of unmanned aerial vehicles (UAVs, commonly called *drones*) has created powerful new tools for civil engineering, environmental science, surveying, disaster response, archaeology, agriculture and many other applied fields. At the same time, drones raise a dense set of ethical questions that touch on privacy, public safety, data governance, environmental protection, equity, professional responsibility, and the risk of dual-use or militarization.

Drones for Eco-friendly Growth: Appliances and Ethical Challenges

Drones are airplanes which work with no human pilot on board. They vary from tiny quadcopters employed for close-variety review to long-lasting immobile-wing devices for wide-zone mapping. Usual civil engineers and technologists utilisations involve:

- Land mapping and surface measurement for planning projects.
- Superstructural surveillance (viaducts, towers, barrage, bridges) to decrease hazard to examiners.
- Development controlling and volumetric dimension on building zones.
- Ecological management (habitation mapping, seaside attrition, forestry healthiness).
- Accurate farming (agricultural healthiness mapping, irrigation supervision).
- Catastrophe evaluation, examination, and savings.
- Archaeological place certification and inheritance protection.
- Atmosphere and environmental information gathering (microweather, bird relocation investigation).

These appliances provide visible social advantages (security, effectiveness, novel information), which should be considered against moral hazards and social expectancy.

Every single choice regarding using drones must be detoured through acquainted ethical and moral standards adjusted to such technology:

- Profit: increase societal well-being (security, knowledge, durability).
- Non-damage: preventing harming people, possession, living things, and ecology.
- Respect for independence and confidentiality: preserve persons' informational confidentiality.
- Equality: guarantee equal sharing of profits and drains (no unequal effects on relegated groups).
- Liability and clarity: allocate accountability, permit supervision, and make techniques clear and understandable to investors.
- Protection: if results are not certain, embrace traditional techniques to avoid damage.

Detailed Ethical Problems

The fast incorporation of drone (UAV) technology into civil engineering, academic, and ecological domains has presented not merely extraordinary chances and opportunities but also complicated ethical difficulties. As drones progressively function in occupied places and delicate ecology, worries spread far beyond technological execution. Ethical and moral reflections currently include problem of confidentiality, security, legitimacy, information supremacy, ecological effect, and societal fairness.

An accountable method to UAV use thus necessitates an inclusive comprehension of the possible dangers connected with information gathering, aeronautical processes, and system independence. This section draws the main ethical and moral fields appropriate to drone investigation and appliance, varying from secrecy and supervision to civic security, supervisory conformity, information honesty, and society relations. Furthermore, it emphasizes applied mitigation policies to make sure that drone-assisted actions go with founded ethical standards, lawful outlines, and civic prospects.

Confidentiality and Supervision

- Unintentional recording of individuals: images and videos frequently capture passers-by or confidential belongings; site metadata may expose secretive conduct.
- Delicate information: facial identification, license-plate capture, or social implication from recurrent supervision enlarge confidentiality dangers.
- Knowledgeable accord: investigation or business flights on personal belonging or societies need processes for notifying touched individuals and getting agreement where practicable.
- Moderation: information moderation, masking/data anonymization, regulating solutions or descriptive data, managing privacy effect evaluation, and civic notification.

Community Security and Operational Hazard

- Kinematic hazards: accidents may hurt people or harm assets.
- Intrusion with other planes: hazards close to airports or operated flying.
- Faults and cyber-assault: software failures or hacking may create erratic conduct.
- Minimisation: expert pilots, logs preservation, redundant safety systems, flight restrictions zones, pre-aircraft danger evaluations and processes.

Flight Exclusive Zones, lawful and, Supervisory Accordance

- Decrees and flight regulations diverge by authority; ethical and moral employment needs severe acquiescence with licenses, airspaces, height bounds, and harmonization with flight jurisdictions.

Note: you must check and respect domestic lawful necessities and institutional strategies prior to flying.

Information Supremacy, Integrity, and Repeatability

- Data provenance: academic integrity relies on accountable data collection of acquisition limitations, time records, device alignment and data processing stages.
- Storing and admission: safe storing, regulated entrance, and transparent retaining strategies avoid exploitation and protect truthfulness.
- Freely available data vs. confidentiality compromises: liberating structured data profits science but can uncover people; de-identification and entry restraints aid keep equilibrium between openness and confidentiality.

Ecological and Nature Effect

- Nuisance to wildlife: down-flight drones may disturb or move animals, change conduct, and damage subtle habitations.
- Environmental disruption: frequent drones in sensitive places may have accumulative impacts.
- Moderation: drones scheduling regulations, defence spaces, and expert eco-friendly leadership and assistance.

Utilisation and Safety Concerns

- Drones may be intended for antagonistic or unlawful purposes (spying, illegal imports or transports); projects must evaluate dual-employment possible and prevent misapplication. Institutional evaluation must respect domestic safety implications.

Fairness, National Agreement, and Civic Relations

- Societies exposed to continuing in-flight monitoring frequently have slight ability to complain or protest. Ethical and moral practices necessitate societal involvement, clear intention declarations, and compassion to cultural settings.

IP and Information Proprietorship

- Who possesses images or imitative products? Transparent accords are essential between academias, funders, business associates and civic investors. Utilise certifying (e.g. information sharing accords) which details rights and duties and responsibilities.

Independence and Human Supervision

- When drones take independent choices (obstruction prevention, objective choice), computer operator must make sure that these actions are controlled for morally subtle choices; independent must not substitute human decisions in high-risks circumstances.

Accountability and Assurance

- Plainly describe who is guilty for mishaps, confidentiality violations or information misutilisation (programmer, institution, and servicer) and get suitable assurance and promised protections.

Counselled institutional Strategies and Positive Practices

Institutions that employ drones (such as academias, research centers, companies) must embrace official strategies which integrate together technological, moral, and ethical protections:

A. Pre-utilisation necessities

- Ethical, moral, and lawful supervision: involve drones in Institutional Review Board or ethics boards' practices when individual topics or private information may be implicated; perform privacy impact assessment and ecological evaluations.
- Authorisations and no-fly-zone allowance: obtain essential licenses from flight powers and national powers.
- Stakeholder involvement: inform where possible, check with communities and proprietors.
- Danger evaluation and moderation plan: identify hazards and document mitigation measures.

B. Operative criterions

- Licenced operators and preparation: necessitate operative skills, authenticated preparation and update lessons.
- Typical effective procedures: pre-aviation specifications, upkeep programmes, mishaps reporting.
- Security mechanism: geoboundary system, automatic recall, emergency recovery systems, and restricted areas.

C. Information control

- Information managing plan: define reason, kinds of information gathered, metadata criterions, entry management, maintenance programme, pseudonymization methods and ultimate information distribution or revealing strategies.
- Safe storing and entry management: guarantee Data protection during storage and transfer; record access events; allow smallest essential privileges.
- Clarity and recording: provide procedural details in scientific reports so that outputs are verifiable and ethically transparent.

D. Eco-friendly protection

- Integrate species/habitation understanding examination and flying regulations; harmonize with ecological professionals.

E. Lawful, IP, and pledged measures

- Employ written contracts (certifying or licensing) which plainly define proprietorship of unprocessed information and plagiaristic products, publication rights and responsibilities.

Applied Pre-Use Ethical and Moral Checklist

- Reason and validation for drones' utilisation declared and recorded.
- Confidentiality effect evaluation finalized (if persons/information may be attained).
- Ecological effect inspection finalized (if in delicate habitations).
- Scientific ethics and organizational agreement (where individual's matters or private information included).
- Territory authorizations and assurance gotten.
- Civic notice and community member involvement completed.
- Technician authorization and preparation checked.
- Crisis processes recorded.
- Information control plan made (storing, entry, pseudonymization, maintenance).
- Safety procedures (safe information diffusion and storing, access control) operative.
- IP/information proprietorship and publication accords signed.
- Incident reporting and audit trail procedures ready.

Case Studies

1. Bridge reviewing: Drone images substitute human entry in unsafe or hazardous sites. Ethical and moral advantages: decrease hazard and enhanced information.

Ethical responsibilities: guarantee no personal property is involuntarily imaged; maintain metadata least; get technician assurance.

2. Littoral bird gathering review: Drone flyings endanger perturbing nesting birds.

Ethical moderation: must not programme flyings during nesting periods, keep height defences, and check with environmentalists.

3. Metropolitan mapping for unofficial communities: Data may sustain planning but as well put in danger weak inhabitants.

Ethical moderation: communal agreement, information pseudoymization, and regulated entry.

Summary

Major Focus	Summary	Main Ethical Matters
Bioethics and	Technology must be ethically and	Existence cycle control, ecological

Major Focus	Summary	Main Ethical Matters
Scientific Growth	morally be controlled to respect human self-esteem and the ecology	consequences, justice in gains.
Signification of Bioethics	Describes main ethical standards which direct academic and communal choices.	Independence, Benefits, No-harm, Fairness.
Biotechnology and Human Research	Genetic study and alteration increase ethical and environmental dilemmas.	Genetic transformation, notified agreement, environmental disruption, justice (biotheft).
Ethics and AI Use	AI gives advantages but also challenges such as justice, clarity, and control.	Clarity, Responsibility, Bias/Justice, Privacy, Human Supervision.
Robotics and Automatic	Automatic affects jobs, accountability, and human self-esteem.	Employment loss, mishaps responsibility, Confidentiality/Supervision, Army utilisation.
Ethics and Drone Employment	Drones provide advantages but rise confidentiality, security, and ecological worries.	Confidentiality invasion, civic security, information managing, environmental effects, dual-utilisation dangers.

Unit 4:

Assessment Section

In this section, students will be assessed on the three units of the programme.

Unit 4: Assessment Section

4.1 Exercises on the Three Units

4.1.1 Exercise on Unit 1: Ethics and Integrity

Debate Questions:

1. Why is being honest crucial for university students and civil engineers in particular?
2. How would you respond if a classmate in a group project reproduces the same work as someone else's?
3. Can you give some instances of ethical issues that might occur in a building project?
4. Can you explain the meaning of academic freedom and say why it is significant?

Ethics in University Context

1. Why do you think it is immoral to cheat on an exam, although some classmates are doing it?
2. What would be your reaction if your classmate used AI means (e.g., ChatGPT) fraudulently in a test?
3. Do you believe that students and teachers should have similar duties? Explain your answer.
4. Do you think students should be reprimanded or disciplined for plagiarism even if they were not aware it was incorrect? Explain your answer.

Reciprocal Respect and Academic Culture

6. How can students demonstrate respect for teachers?
7. Can you give pieces of advice to students about how to be fair to others during teamwork or group projects?
8. Can you give some instances of bad conduct in university, and say what the outcomes are?
9. Do you think it is ethical to share a classmate's project or thoughts without asking their permission?

Integrity in Study and Research

11. Why are honesty and integrity significant in research and science?
12. What would occur if civil engineers employed fake information in a construction calculation?
13. Why is it vital to be real and avoid copying or giving exaggerated results?
14. Can you say what distinguishes a mistake from dishonesty in research?
15. Did it happen a time when a classmate was unjust in a team? What could have been enhanced?

Fairness and Justice

16. Is it fair-minded to offer the equivalent mark to all team members when only a few did the work? Explain your answer.
17. How would you react if a classmate gives money to obtain a good grade or diploma?
18. How can the university encourage fairness among students from diverse milieus?
19. What rules should be in place to make university life more ethical?
20. What would be the right definition of a good engineer in terms of ethics?

Case 1: University Context:

Scenario:

You are working on a team project in your civil engineering lecture. One of your group members doesn't do any of the work asked but still desires to have his name on the project report.

- What would you do in that case?
- Analyse this case employing the ethical decision-making checklist given in Unit 1.
- Do you think it is just or fair to comprise his name? Explain your answer.
- How can you clarify this situation to your teacher, utilising ethical terms?

Case 2: Unsecure Shortcut

A Case Study:

You are a beginner engineer on a building site. The contractor demands that you skip part of the security check-up to avoid wasting time. He states, that nobody will know, and that they are already behind the timetable.

Questions:

- What are the dangers of skipping security processes?
- Examine the scenario utilising the ethical decision-making grid offered in Unit 1.
- Would you do what your manager requests? Explain your answer.
- What is the ethical decision to make in this situation?

Case 3: Fake Data in a Project Report

Scenario:

In order not to get a bad mark, a civil engineering student faked his lab trial results that the teacher expected and changed the numbers in the final report.

Questions:

- Is this a kind of academic fraudulence? Explain your answer.
- What could occur if this type of conduct continues in professional work?
- How would the student truthfully avoid the problem?

Case 4: Group Project Conflict

Scenario:

The teacher gave a group of students an assignment project about bridge design. One student did all the calculations and plans, whereas the other team members did very little. By the end, the whole group wants to have the same grade.

Questions:

- Do you believe it is impartial for all the group members to obtain the equivalent mark? Explain your answer.
- What should the hardworking and serious student do in this case?
- How can teamwork be run honestly?

Case 5: Utilising AI Means

A Case Study:

In the course of a technical writing test, a student employs an AI device (such as ChatGPT) to copy the entire report. The students do not cite this in their work.

Questions:

- Is it always dishonest to utilise AI? What is the most important?
- Is it compulsory for students to inform the teacher about? Explain why.

Case 6: Kickbacks in the Internship

A Case Study:

A civil engineering student wants to apply for a training period at a famous firm. Some people propose that they can accelerate the procedure if the student gives a sum of money under the table.

Questions:

- Is paying for accelerating the procedure of an internship ethical? Explain your answer.
- What would the student's risk be of paying or approving kickbacks in the engineering domain?
- What would be the ethical response of the student in this situation?

Case 7: Plagiarism in Design Work

A Case Study:

A civil engineering student copies an AutoCAD draft of a construction foundation online and hands it over as a part of their drawing project, without citing the source.

Questions:

- Is this deemed to be plagiarism? Why? Why not?
- How could the student act to prevent this error?
- How could drawing work be original while still learning from others?

Quiz:

1. What is meant by plagiarism?

- A. Utilising another person's words or thoughts without acknowledgement ✓
- B. Working with others in a team
- C. Citing references in a report
- D. Inventing a new invention

2. Which of the following is NOT a student's responsibility at university?

- A. Respecting classmates and teachers
- B. Keeping away from cheating
- C. Paying kickbacks to succeed on exams ✓
- D. Doing your work

What does academic integrity signify?

- A. Doing your work with honesty ✓
- B. Giving money for the answers to your homework
- C. Requesting your classmate to take an exam for you
- D. Falsifying marks on a paper

2. What will you do if you do not comprehend your homework?

- A. Copy the work from your classmate
- B. Ask the teacher to clarify the assignment ✓
- C. Do not do the assignment
- D. Employ AI to do it without verifying

3. Which of the following is NOT considered ethical conduct in teamwork?

- A. Aiding each other similarly
- B. Listening to your team members
- C. Asking one person to do all the work ✓
- D. Respecting group choices

4. What is a student's responsibility at university?

- A. Breaching regulations to finish rapidly
- B. Respecting people, rules, and property ✓
- C. Doing just what the teacher requests
- D. Always working individually

B. True or False Statements

1. Academic freedom signifies that students are allowed to cheat in exams.

False ✗

2. Students are allowed to copy responses from the internet as long as the teacher does not verify.

False ✗

3. Both teachers and students have ethical duties.

True ✓

4. To be respectful, honest, and fair is a vital ethical behaviour.

True ✓

5. To conceal errors in a team project is tolerable.

False ✗

C. Fill in the Blank

1. _____ signifies honesty and doing the correct thing, even when no one watches.

→ **Integrity**

2. When students steal somebody else's work and state it is their own, this is called _____.

→ **Plagiarism**

3. In a group project, all students must share the _____ similarly.

→ **Work/responsibility**

4. Students must report any _____ conduct they witness throughout exams.

→ **Cheating / dishonesty**

5. The university encourages values of _____, equality, and academic liberty.

→ **Respect/ethics/integrity**

D.Vocabulary and Concept Reviewing

Put the following terms with their appropriate descriptions. Write the letter (A–J) next to the correct number.

No.	Terms	Descriptions
1	Ethics	A. The action matching to individual's moral standards and professional principles.
2	Integrity	B. The procedure of assessing ideas justly, founded on proof, not feelings.
3	Fairness	C. The liberty to study, investigates, and instructs thoughts with no fright or prejudice.
4	Academic Freedom	D. Employing another individual's terms or thoughts as his own.
5	Plagiarism	E. Standards which describe what is correct and incorrect in human behaviour.
6	Bias	F. Unjust handling of persons founded on race, sex, or convictions.
7	Objectivity	G. The capacity to analyze problems rationally and freely.
8	Critical Reflection	H. Handling others fairly and providing all individuals what they merit.
9	Scientific Honesty	I. Being honest and clear in research, instructing, and information gathering.
10	Accountability	J. The responsibility to deed with carefulness, justice, and respect in all circumstances.

E. Reading Comprehension

Read the following passage carefully and answer the questions that follow.

Ethics in University

Ethics in higher education denotes the moral principles which rule the conduct of learners, instructors, and academics. It involves values like truthfulness, justice, respect, regards, and accountability. All members of the scientific community are supposed to maintain honesty by preventing dishonesty, deception, plagiarism, and bias.

Academic freedom permits teachers and academics to search, review, and issue their ideas independently, providing they stick to the standards of genuineness and objectivity. Simultaneously, academics have the responsibility to generate a respectful setting in which views may be exchanged freely without enmity or aggression.

Furthermore, directorial and technical workers have also a crucial role in maintaining ethical standards. Their work supports transparency in the evaluation process, fairness in hiring, and the privacy of students and scientific data. Supporting and maintaining ethics guarantees that academics stay trustworthy institutions which add to the growth and development of knowledge and communal faith.

Questions:

1. Give the definition of the term ethics according to the text.
2. What is the signification of academic freedom?
3. Cite two ethical responsibilities of university workers.
4. Why is integrity crucial for a higher education's trustworthiness?
5. What may occur if scientific morals and ethics are overlooked?

F. Grammar in Academic Setting

Put the appropriate form of the words between brackets.

1. Instructors are assumed to evaluate learners _____ (just) and objectively.
2. Learners should act _____ (respect) toward each other.
3. Preventing plagiarism is an indication of _____ (integrity).
4. Academics must always look for the _____ (true) and describe outcomes exactly.
5. The administration workers are _____ (accountability) for guaranteeing clarity in exams.

G. Case Vignettes: Ethical Dilemmas

Read the following scenario carefully and respond the questions below.

You belong to a research group at the university. One of your fellow students proposes utilising sections of another team's information with no reference because all students do it. Another classmate opposes, claiming that this act could be regarded as cheating or plagiarism. The deadline to submit the work is close, and the team needs to make a decision rapidly.

Questions:

1. Give the ethical problem in this scenario.

2. Examine the scenario utilising the ethical decision-making step-by-step given in Unit 1.
3. How should the team act to maintain scientific honesty and integrity?
4. How might groupwork and communication aid resolve this issue?
5. What could be the results of overlooking plagiarism regulations?

H. Discussion and Contemplation

Discuss the following questions in groups or write down brief answers:

- How may analytical reflection enhance ethical decision-making?
- Why are justice and respect significant in team work?
- What could instructors and learners do to endorse integrity in academia?

4.1.2 Exercise on Unit 2: Intellectual Property

Debate Questions:

1. Why is it imperative to mention your sources in your work?
2. What distinguishes a patent from a copyright?
3. Can software and websites be copyrighted? Explain how?
4. Have you ever watched someone copy or steal a drawing or logo? Say what happened?

Comprehending the Fundamentals of Intellectual Property

1. Can you define intellectual property using your own words?
2. What are the two kinds of intellectual property? Give an instance of each kind.
3. Why, according to you, is it crucial to protect your thoughts or innovations?
4. What occurs when a person employs someone else's idea without authorisation?
5. Do you believe students need to learn about IP at the very beginning of their studies? Explain your answer.

Citations and Academic Honesty

6. Why is it imperative to mention books and papers in one's reports?
7. What distinguishes copying from utilising information with a reference?
8. What occurs when a student fails to cite a source in their project?
9. What are the ways to verify if your writing involves plagiarism?
10. What is your feeling when a person acknowledges your work?

Copyright and Digital Devices

11. Can websites or software be defended by copyright? Explain your answer.
12. Did you employ an image or text online in your work? Did you or not mention the reference?

13. Can you define free software? Are you able to utilise it in your upcoming work?
14. Why is it incorrect to download and employ paid software with no license?
15. Could you mention some instances of intellectual property utilised in civil engineering (such as designs or drafts)?

Patents and Invention

16. What is meant by a patent, and why may an engineer require one?
17. Do you believe Algerian students or engineers can obtain patents? Explain how.
18. Would you wish to create something in the near future? Say, what would it be?
19. What renders a thought patentable? Is it expected to be big or new?
20. Why is it imperative for engineers to grasp how to defend their innovations?

Protection and Value

21. What can you do to defend your academic work from being copied or stolen?
22. What would be your feeling if a person shares your design or report without your permission?
23. In your view, what renders an idea valued?
24. What distinguishes sharing your work from permitting someone to copy it?
25. How could defending intellectual property aid you in your upcoming professional life?

Case 1, Civil Engineering Context:

A Case Study:

A student finds a YouTube video demonstrating a novel green concrete combination. He copies the content into his final-year project work without citing the video.

- What type of intellectual property issue is occurring?
- How should the student solve the issue?
- What are the potential outcomes of his action?

Case 2: Copying/Stealing a Design

A Case Study:

A student is doing his final-year project on sustainable accommodation. He finds a faultless AutoCAD blueprint on a German architecture site. He translates the tags into English and presents them as his work.

Debate Questions:

- Is this an instance of plagiarism or copyright infringement?
- What would be the correct action?
- How can this action impact the student's trustworthiness in the future?

Case 3: Free Software Misunderstanding

A Case Study:

A civil engineering student downloads a pirated form of paid software (e.g., AutoCAD) and utilises it in a class project. He thinks it is allowed as it is only for education.

Debate Questions:

- Is employing pirated software legal or not? Explain your answer.
- What are the dangers for the university and the student?
- What substitutes can the student utilise (e.g., free-source or instructive licenses)?

Case 4: Incorrect Reference in a Report

A Case Study:

In a building report about materials, a student steals or copies technical data from three papers with no citations or quotation marks. He believes it is allowed since he reformulated the information.

Debate Questions:

- Is this considered plagiarism, even if the student paraphrased the information?
- What is the proper manner to utilise someone else's thoughts?
- What are the devices or approaches to prevent plagiarism?

Case 5: A Genius Idea without Protection

A Case Study:

Two civil engineering students create a novel green highway material employing local remaining materials. They talk about their thought to their classmates and on social media without recording or protecting them.

Debate Questions:

- What would occur if another person claims the invention and patents it?
- How could the students have prevented their idea from being stolen?
- Why is it significant to maintain records and obtain lawful guidance?

Case 6: Intellectual Property and Social Media

A Case Study:

A civil engineering student shares on Facebook a part of their graduation project about a bridge design to get feedback. One year later, he finds out that a building company is utilising the scheme in an actual project without authorisation.

Discussion Questions:

- Who is the owner of the design?
- What is the student's error?
- What could he have done before sharing a part of his work online?
- Do you think it is secure to post educational work on social media?

Case 7: Patent Misunderstanding

Scenario:

A fresh graduate student discovers a time-saving construction method. His friend proposes requesting a patent, but the student believes patents are just for scientists, not engineers.

Discussion Questions:

- Is it allowed for civil engineers to apply for patents?
- What are the stages to request a patent in Algeria or universally?
- Why is it significant to comprehend patent rights as an engineer?

Quiz:

1. What is meant by a patent?

- A. An entitlement (right) to utilise the internet
- B. A entitlement (right) to alter another person's work
- C. A lawful right to defend and protect an invention ✓
- D. A university diploma

2. Among the following, which can be protected by copyright?

- A. Music and books ✓
- B. Dams and highways
- C. Concrete
- D. Bridges

3. Free software is

- A. Software that is never payable
- B. Software that users can copy, alter, and distribute under a license ✓
- C. Software that does not function online

D. Software with no proprietor

1. Plagiarism is about:

A. Writing about your point of view

B. Employing a person's work with no authorisation or acknowledgement ✓

C. Requesting aid with assignment

D. Being a member of a team

2. Which of the following is an example of intellectual property?

A. A brick

B. A recipe for concrete mix ✓

C. A hammer

D. A calculator

3. Which tool can help you check for plagiarism?

A. Microsoft Excel

B. Turnitin ✓

C. AutoCAD

D. STAAD.Pro

4. What should you do when you use a paragraph from a book in your report?

A. Translate it and change the words

B. Copy it without telling anyone

C. Put quotation marks and give a citation ✓

D. Add a photo instead

5. What does a patent protect?

A. A university examination

B. A drawing, creation, or novel technique ✓

C. A music folder

D. A video game hero

B. True or False Statements

1. It is allowed to copy and paste data online if you reformulate or paraphrase the information.

→ **False ✗**

2. Free software may always be employed in business work.

→ **False ✗** (It depends on license)

3. A title of a book is allowed to be protected with intellectual property regulation.

→ **True ✓**

4. When a work is posted on the internet, it is certainly free to utilise.

→ **False ✗**

5. Mentioning your references demonstrates reverence and respect for the original inventor.

→ **True ✓**

C. Fill in the Blank: The following statements

1. A _____ is a lawful defence and protection for an innovation or a new approach.

→ **Patent**

2. _____ signifies employing someone else's thoughts with no authorisation or acknowledgment.

→ **Plagiarism**

3. You must always _____ your references when noting a report.

→ **Cite**

4. _____ property denotes things such as drawings, videos, books, and creations.

→ **Intellectual**

5. Distributing payable software without a license is a kind of _____.

→ **Piracy/copyright infringement**

Matching Exercise

Match the term to the definition:

Term	Definition
<i>Patent</i>	A. Employing someone's thought without acknowledgement
<i>Plagiarism</i>	B. The lawful entitlement of authors over their inventive work
<i>Copyright</i>	C. Defence for creations and novel technical resolutions
<i>Citation</i>	D. Citing the reference of information employed in your work
<i>Intellectual Property</i>	E. Inventions of the mind, such as music, art, designs, and creations

Answers:

- ✓ Patent → C
- ✓ Plagiarism → A
- ✓ Copyright → B
- ✓ Citation → D
- ✓ Intellectual Property → E

Reading Comprehension

Read the following text carefully and answer the questions below.

Comprehending Intellectual Property in the Digital Era

Intellectual Property (IP) denotes the lawful privileges given to inventors for their creations, art works, and digital material. It involves two major fields: industrial property (like designs, patents, and trademarks) and literary or art property (like books, songs or music, and software).

Copyright preserves the communication of thoughts but not the thoughts themselves. For instance, a student's investigation work or an online database may be safeguarded provided its constitution and configuration demonstrate novelty and inventive endeavour.

The rising employment of the internet has rendered preserving digital material more multifaceted. Pictures, Software, virtual trainings, and videos may be imitated or posted without authorisation, guiding to moral and lawful issues. Users must thus regard certifying terms, give correct references, and prevent plagiarism.

Algeria, as being a part of the World Intellectual Property Organization (WIPO), has embraced its regulations to universal treaties, comprising the Berne Convention. This makes sure that together national and international inventors appreciate lawful preservation. Academic institutions now encourage students to comprehend IP rights and privileges as an element of responsible research conduct.

Questions:

1. What are the two major fields of IP?
2. What do copyrights safeguard?
3. Why is online material more complex to preserve?
4. How do Algerian regulations match with global principles?
5. Why is it crucial for students to grasp IP rights?

Vocabulary and Notion Matching

Terms

Descriptions

- | | |
|---------------|--|
| 1. Plagiarism | a. Unallowed utilisation of another person's words or information. |
| 2. Trademark | b. Lawful safeguarding for literary and artistic products. |
| 3. Copyright | c. Preserves catchphrases, logos, or brand signs. |
| 4. Database | d. Lawful right offered for a creation or innovation. |
| 5. Patent | e. An organized gathering of ordered data. |

True or False Statements and Justification

Write True or False, and then justify your answer if the statement is false in one sentence.

1. All kinds of data may be copyrighted. (___)
2. A database can be protected providing it demonstrates innovative organization. (___)
3. Utilising an online image for your research is generally permitted. (___)
4. Algeria adheres to universal copyright treaties. (___)
5. Free-basis software has no copyright. (___)

Writing Exercise

Write a short essay of 8 sentences and explicate the following:

Why is it crucial for higher education students and academics to respect and regard copyright and IP regulations, particularly when utilising online devices or databases?

Comprise:

- The significance of granting acknowledgement;
- The consequences of plagiarism;
- The advantages of ethical research habits.

4.1.3 Exercise on Unit 3: Ethics, Technology, and Sustainable Development

Debate Questions:

1. How can engineers contribute to protecting the ecosystem?
2. Can you cite the major hazards of employing AI in structures?
3. Is sustainability essential in current civil engineering?
4. How can you take responsible choices in civil engineering?

Ethics and Novel Technologies

1. What are the key advantages of employing technology such as drones or AI in civil engineering?
2. What would happen if engineers utilise technology with no ethical regulation?
3. Is it necessary that AI machines be utilised to ensure security choices on building sites? Explain your answer.
4. What kind of data should not be distributed on the internet by engineering firms? Explain.
5. How could engineers employ websites and social media responsibly?
6. Can you explain digital responsibility using your own words?
7. Do you believe engineers need to be aware of how their designs impact confidentiality (e.g., CCTV, sensors)? Explain.

Sustainability in Civil Engineering

8. Why is sustainability significant in building and town planning?
9. Can you label some green construction materials or methods?
10. How would civil engineers aid in decreasing pollution or trash in projects?
11. What is the risk of disregarding ecological effects in construction design?
12. How does employing a lot of concrete impact the environment?
13. Can you explain green building?
14. Can firms gain money from sustainability? Explain how.

Taking Responsible Decisions

15. What would you decide to do if your employer requests you to utilise low-priced but dangerous materials?
16. How would you maintain equilibrium between benefit and sustainability in civil engineering?
17. What would be better: to construct rapidly and inexpensively or unhurried and securely? Explain.
18. How must engineers consider the upcoming generations when they construct?
19. Should engineers have a duty to defend and protect the globe? Explain.
20. What could an ethical engineer do while encountering a tough choice?

Consideration and Future Thinking

21. What future do you desire to have as a future civil engineer?
22. Can you name some technologies you are most enthusiastic about utilising? Say why.

23. According to you, what are the hazards of overlooking sustainability and ethics in civil engineering?
24. Say one action you would do currently to be a more accountable future engineer.
25. Do you believe ethics and sustainability should be part of all engineering lectures? Explain.

Case 1: Sustainability Context

A Case Study:

A building firm intends to construct a shopping centre employing low-cost materials which pollute the national river. As a beginner civil engineer, the company asks you to accept the project.

- What are the ethical worries in this situation?
- What sustainable substitutes would you propose?
- How can you clarify your choice to your employer?

Case 2: AI for Engaging Engineers

A Case Study:

A civil engineering company employs an AI tool to select applicants for residencies. The method is rapid, but it always chooses masculine students and overlooks candidates from rural zones.

Debate Questions:

- Do you think this system is just? Justify your answer.
- What would the firm do to solve this issue?
- Who is to blame when a system makes an unjust choice?

Case 3: Low-priced Materials vs. Green Materials

A Case Study:

A building project is above the financial plan. The site supervisor asks the engineer to end the use of green cement and change to inexpensive, more contaminating cement to avoid wasting money.

Debate Questions:

- What are the lasting dangers of this choice?
- Is economising money more significant than preserving the environment?
- What would be your decision in this case?

Case 4: Employing Drones on a Construction Site

A Case Study:

Your firm wishes to employ drones to manage staff on a building site for security purposes. Certain workers judge that their confidentiality is being overrun.

Debate Questions:

- Do you believe it is ethical to scrutinise workers without their agreements?
- Analyse the case study employing the ethical decision-making checklist given in Unit 1.
- How could we use technology assistance with security and respect confidentiality simultaneously?
- What must the firm convey to workers?

Case 5: Laboratory Waste Running

A Case Study:

At the department, civil engineering students frequently dispose of chemical wastes and concrete mixture into the routine rubbish. Nobody cares about it, and no severe regulations exist.

Debate Questions:

- What are the ecological dangers of the above conduct?
- What plain procedures can the laboratory do to enhance this?
- Is students' conduct part of civil engineering standards?

Case 6: Constructing on Protected Site

Scenario:

A civil engineer is engaged to design a tiny barrage. While visiting the site, she discovers that the site is beside a defended wood with threatened species (animals).

Debate Questions:

- Should she carry on the project? Justify your answer.
- What substitutes can she suggest?
- How can engineers do their work and respect nature at the same time?

Case 7: Smart Roads and Information Confidentiality

A Case Study:

An intelligent route is being tried in a new town. It gathers circulation and drivers' information to enhance security. But a lot of people are concerned that their private info will be misutilised.

Debate Questions:

- How would engineers protect information confidentiality in intelligent systems?

- Is gathering information always a positive point? Explain your answer.
- What types of regulations need to be applied to direct technology utilisation?

Case 8: Water Preservation in Design

A Case Study:

You are building a lodging project in a waterless zone. The customer desires to employ normal sanitation systems, but you propose employing a water-saving system that is more expensive.

Debate Questions:

- How would you explicate the significance of sustainability to the customer?
- Do you believe it is your task to ensure the project is sustainable?
- Do you think engineers need to promote lasting profits, even if it is high-priced?

Quiz:

1. What does sustainability signify?

- A. Employing materials coming from other nations
- B. Cooperating on short projects
- C. Encountering current requirement without damaging the future ✓
- D. Constructing smart constructions

2. Which of the following is a responsible action?

- A. Hiding building mistakes
- B. Utilising reprocessed (recycled) materials in a way project ✓
- C. Overlooking security regulations
- D. Giving bribes for rapid authorisation

3. What is one danger of AI in civil engineering?

- A. It always makes the work faster
- B. It can replace all human workers
- C. It can be unfair if the data is biased ✓
- D. It is the same as plagiarism

1. What does sustainability mean in civil engineering?

- A. Building as fast as possible
- B. Using eco-friendly designs that protect the environment ✓
- C. Using cheap materials only
- D. Avoiding teamwork

2. Which of the following is a danger of employing artificial intelligence (AI) with no control?

- A. Rapid building
- B. Reduced worker salaries
- C. Unjust or prejudiced choices ✓
- D. Enhanced team communication

3. Why must engineers consider upcoming generations when designing?

- A. To gain a lot of money
- B. To preserve natural resources ✓
- C. To prevent utilising new technology
- D. To build only in cities

4. What is one way to decrease pollution in a building?

- A. Construct and work just at night
- B. Reutilise and recycle materials ✓
- C. Use old machines
- D. Avoid hiring specialists

5. Why do you think it is crucial to preserve workers' information in intelligent systems?

- A. To give them a break
- B. To augment control
- C. To respect confidentiality rights ✓

D. To prevent wasting paper

True or False Statements

1. Technology is the first creator of ethical issues in engineering.

→ **False** ✘

2. Civil engineers must feel concerned regarding nature and the globe.

→ **True** ✔

3. Intelligent constructions cannot save energy.

→ **False** ✘

4. Utilising AI in engaging ought to be just and not prejudiced.

→ **True** ✔

5. Engineers are not responsible for what occurs once a construction is completed.

→ **False** ✘

Fill in the Blank

1. Sustainable building is necessary to preserve the _____ for upcoming generations.

→ **Environment**

2. When an AI system makes an unjust choice, it will be an issue with _____.

→ **Bias or ethics**

3. Employing _____ materials, such as reprocessed concrete, aids in reducing waste.

→ **Green or sustainable**

4. Novel technologies should be utilised with _____ responsibility.

→ **Ethical**

5. Information gathering from intelligent systems must be maintained _____.

→ **Private or confidential**

Matching Activity

Match each term to its proper significance:

Term	Definition
<i>Artificial Intelligence</i>	A. Employing planet-friendly systems in building
<i>Sustainability</i>	B. A digital way that can make choices as individuals
<i>Bias</i>	C. Treating a team unjustly in information or choices
<i>Green Construction</i>	D. A building designed to utilise less energy and water
<i>Confidentiality</i>	E. Preserving people's private information

Answer Key:

- ✓ AI → B
- ✓ Sustainability → A
- ✓ Bias → C
- ✓ Green Construction → D
- ✓ Confidentiality → E

Reading Comprehension

Ethics and Sustainability in Engineering

Engineering has a key position in attaining sustainable growth. Nevertheless, technological progress must be guided by ethical considerations. Ethical engineers design structures and systems that protect human life, promote social welfare, and preserve the environment.

New technologies, including Artificial Intelligence (AI), drones, and robotics, offer solutions for building safer and more efficient infrastructure. Yet, they also raise ethical concerns such as privacy invasion, environmental harm, and job displacement. Responsible professionals must ensure that these technologies serve the public good and comply with legal and ethical standards.

Sustainable development aims to meet present needs without compromising the ability of future generations to meet theirs. This goal requires engineers to think critically, act transparently, and balance innovation with environmental responsibility.

Questions:

1. How can engineers contribute to sustainable development?
2. What ethical problems may arise from new technologies?
3. Define sustainable development in your own words.
4. Why is transparency important in engineering?
5. How can technology both help and harm the environment?

Vocabulary Practice

Fill in the blanks with the correct word: *corruption – sustainability – ethics – AI – transparency – innovation*

1. Engineers must demonstrate _____ by making fair and responsible decisions.
2. _____ refers to meeting today's needs without harming future generations.
3. The misuse of power for personal gain is called _____.
4. _____ in research and construction builds public trust.
5. _____ is transforming engineering through automation and data analysis.
6. Ethical _____ should aim to improve life quality without causing harm.

Analytical Reflection Discussion

Answer the following questions small groups and write your ideas:

1. How can civil engineers guarantee that novel technologies are utilised morally?
2. Must there be severe regulations to control the employment of AI and automation in building?
3. What is the role of ecological ethics in sustainable projects?
4. How could Algerian young civil engineers add to sustainability and honesty?

Project Activity

Prepare a small team talk about one of the following subjects:

- Ethics and eco-friendly accountability in civil engineering design.
- The position of IP in technological invention.
- How can AI sustain ecological and ethical engineering?
- Avoiding plagiarism and endorsing novelty in higher education research.

Groups should:

- Give authentic or theoretical instances.
- Utilise PPT presentation.
- Wrap up with realistic recommendations.

Insightful Writing

Write a short thoughtful essay:

Define an ethical scenario that you have encountered or could encounter in your studies or upcoming career. Explicate how you would act to uphold, honesty, integrity, regard, and accountability.

Conclusion

This handout offers a thorough examination of ethics, integrity, intellectual property, and the ethical aspects of technology and durable growth. Via the four interrelated units, students are endorsed to comprehend and utilise moral values and standards in scientific, professional, and technical settings.

In Unit One, students have delved into the basic values of integrity and ethics since they are used in academic life, research, and professional settings, especially in scientific and civil engineering environments. They have acquired that ethical conduct is based on principles like uprightness, impartiality, respect, accountability, neutrality, and clarity. Through the examination of the rights and duties of teachers, students, and administrative personnel, students have grasped the significance of producing a cooperative, respectful, and responsible university community. The unit has highlighted the prevention of fraud, plagiarism, scientific deception, fabrication, and misconduct, stressing the outcomes of unethical deeds on institutions, individuals, and society. Moreover, students have studied the ethical management of dishonesty, conflicts of interest, confidentiality, and developing knowledge of individual, professional, and social accountability relationships. Applied tools, comprising ethical grids, checklists, step-by-step decision-making approaches, and case studies, have offered learners realistic strategies to examine dilemmas and make ethically defensible decisions. Via such frameworks, students are prepared not just to support university integrity but also to employ ethical analysis in civil engineering, investigation, and professional settings. Ultimately, this unit trains students to take action reliably and honestly, guaranteeing that their choices and deeds contribute constructively to the community, preserve the ecosystem, and uphold the integrity and honesty of the university and professional environments. Ethical behaviour is thus introduced not only as a series of regulations but as a lasting engagement which steers knowledge production, group work, and professional preparation.

In Unit Two, students have assimilated that intellectual property (IP) is crucial for preserving and attaching importance to their ideas, inventions, and research. They have grasped the various kinds of IP, literary and artistic rights, brand names, registered designs, patents, and commercial confidentiality, and how every kind protects particular original works in university, professional, and industrial settings. Moreover, students have strengthened their understanding to act practically in order to preserve and safeguard their work, for instance: design registration, applying for patents, securing copyrights, and adhering to ethical referencing practices. They have studied the significance of ethics in IP, learning to acknowledge others' work, prevent plagiarism, and make accountable decisions when sharing or utilizing IP. Moreover, students have figured out how IP may be reinforced, through altering concepts into patents, scholarly publications, technological innovations, or cooperative projects, so that their work contributes to social development and promote sustainability advancement. Lastly, they have comprehended the requirements for patentability (originality, innovation step, industrial usefulness, and adherence to legal/ethical standards) and why not every creation qualifies for protection, empowering the connection between inventions, responsibility, and the societal welfare.

In Unit Three, students have come to understand that civil engineers are not just designers of structures but also accountable choice-makers whose decisions impact people, societies, and the ecosystem. They grasped the tight relation between sustainability and ethics, understanding that ethical reflection guides civil engineers to save ecological reserves, decrease pollution, preserve energy, and design projects that profit jointly present and upcoming generations. Students studied how energy

conservation, eco-friendly materials, and sustainable building approaches are not only moral necessities but ethical duties that indicate impartiality, responsibility, and respect for the ecosystem. In addition, they acquired to employ ethical decision-making tools like grids, step-by-step approach checklists, and analytical thinking questions; to assess complex cases in which financial, societal, and ecological standards may oppose or struggle. The unit has presented the significance of bioethics and technology ethics, demonstrating that creations in robotics, artificial intelligence, automation, and biotechnology must be directed by values such as transparency, accountability, equality, and respect for individuals. Students explored practical applications, like the use of drones in civil engineering, and grasped how to weigh technological opportunities with confidentiality, security, environmental consequences, and social impartiality.

Finally, **in Unit four** the student has evaluated **ethical standards, integrity, and impartiality** in both university and civil engineering environments. They exercised **examining ethical dilemmas** and practised making accountable decisions employing grids, checklists, and step-by-step approaches. They also recognized the **significance of intellectual property rights**, comprising protection for inventions, rights of authorship, references, and preventing plagiarism. Moreover, they examined the **accountable utilisation of technology**, comprising AI, digital tools, and online materials, with attention to moral and legal aspects. Students grasped the importance of **environmental responsibility** in civil engineering, involving eco-friendly materials, green approaches, and sustainable planning for tomorrow. They empowered skills in **collaboration, communication, and analytical reflection**, using moral reasoning to projects and debates. **After completing this unit, the students are better equipped to act as an accountable, ethical, and eco-friendly aware future civil engineer.**

On the whole, students have developed technical and analytical skills to make accountable, thoughtful, and moral decisions in civil engineering projects, guaranteeing that technology benefits the environment and the community at the same time, while maintaining and supporting professional ethics and ethical responsibility. Overall, the handout points to advance ethically and morally accountable, updated, and thoughtful future civil engineers who will be able to balance originality with ethical accountability, donating constructively to society and sustainable advancement.

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