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Islam and Science

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Islam and Science

Lecture-Wise Study Handout
Virtual University of Pakistan

14 lectures • prepared for exam study 

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About This Course

This course explores the relationship between Islam and science: what Islam says about knowledge and inquiry, how Muslim civilization led world science for centuries, why that leadership faded, and how Muslims today should engage with modern science and technology.

Each lecture combines Islamic sources (Quran and Sunnah), historical achievements of Muslim scientists, and contemporary issues — from bioethics to artificial intelligence — with definitions, examples and exam pointers. 

Lecture 1: Islam and Knowledge: The Scriptural Foundations

Learning Objectives

- Describe Islam's view of knowledge
- Explain the scriptural basis of scientific inquiry

Islam's attitude to knowledge is established in the very first revelation: Read in the name of your Lord. The Quran repeatedly commands reflection — on the heavens and the earth, on the alternation of night and day, on the creation of living things — presenting nature as a book of divine signs (ayat) inviting study. Seeking knowledge is declared obligatory on every Muslim, male and female.

The Quran's epistemology honours multiple sources of knowledge: revelation, reason (aql — used in over 300 verses urging thought), observation and experience. Blind imitation is condemned; evidence is demanded (bring your proof). This is the scriptural foundation of the scientific spirit: a universe that is orderly, intelligible and worth investigating because it reveals its Creator.

A very important distinction for exams: Islam distinguishes sacred from secular only in purpose, not in legitimacy. Medicine, astronomy and mathematics are religiously meritorious when pursued to benefit mankind — the intention (niyyah) sanctifies the discipline. There is therefore no Islamic basis for the claim that science is un-Islamic; the conflict narrative belongs to a different civilization's history.

Key Definitions

Islamic epistemology of science is defined as the Quranic view that nature is orderly and intelligible, inviting rational investigation as worship

Key Points — very important for exams

First revelation commands reading; 300+ verses urge reflection on nature as divine signs.

Sources of knowledge: revelation, reason, observation — blind imitation condemned.

No sacred/secular divide in legitimacy: beneficial science is religiously meritorious.

Review Questions

- ? How does the Quran present nature?
- ? Why is there no Islam-versus-science conflict in Islamic thought?

Section Summary

Islam commands the study of nature as worship: reason and observation are religious duties, not rivals of faith.

Exam Pointers

- Explain the Quranic encouragement of scientific inquiry with verses and hadith.

Lecture 2: The Scientific Method in Islamic Civilization

Learning Objectives

- Trace the scientific method's Islamic roots
- Describe Muslim contributions to methodology

The scientific method — observation, hypothesis, experimentation, verification — has deep Islamic roots. The Quran's repeated demand for evidence (hatu burhanakum — bring your proof) established an evidential culture, and Muslim scholars institutionalized it: Ibn al-Haytham's optics combined controlled experiments with mathematical analysis, and Al-Biruni insisted on precise measurement and repeated trials.

Muslim methodology added distinctive features: the isnad system of hadith criticism — rigorously grading reports by narrator reliability — was a pioneering science of source criticism, and it trained a whole civilization in evaluating evidence. Hospitals (bimaristans) kept clinical records; astronomers built observatories for systematic observation.

The lesson for exams: the experimental method did not arrive in the Muslim world as a foreign import — it was developed there, centuries before Bacon. Recognizing this corrects the textbook story that science began in 17th-century Europe and restores Muslim agency in the history of reason.

Key Definitions

Isnad criticism is defined as the hadith sciences' rigorous grading of reports by narrator reliability — a pioneering method of source criticism

Key Points — very important for exams

Quranic evidential culture: bring your proof — observation, hypothesis, experiment, verification.

Ibn al-Haytham: controlled experiments + mathematics; Al-Biruni: precise measurement.

Isnad criticism trained the civilization in source evaluation; hospitals kept clinical records.

Review Questions

- ? How did isnad criticism resemble modern source evaluation?
- ? Give two examples of experimental method among Muslim scientists.

Section Summary

Systematic observation, experiment and evidence-criticism were cultivated in Islamic civilization centuries before modern Europe.

Exam Pointers

- Show that experimental and evidential methods have Islamic roots, with examples.

Lecture 3: The Golden Age of Muslim Science

Learning Objectives

- Describe the Golden Age of Muslim science
- Analyse its rise and decline

Between the 8th and 14th centuries, the Muslim world led global science — the Golden Age. The Abbasid Bayt al-Hikmah (House of Wisdom) in Baghdad translated Greek, Persian and Indian works into Arabic, creating the common scientific language of the age; Cordoba, Cairo and Samarkand later shone as research centres with libraries, observatories and hospitals.

Why did science flourish? Patronage (caliphs funded translation and research generously), the Quranic valuing of knowledge, practical needs (prayer times and the qibla demanded astronomy; inheritance law demanded algebra), paper technology from China making books cheap, and a cosmopolitan scholarly culture in which Muslims, Christians and Jews collaborated.

The Golden Age ended gradually: the Mongol destruction of Baghdad (1258) was symbolic, but deeper causes included the fragmentation of patronage, the rise of rote learning over inquiry in some madrasas, economic decline, and eventually European colonialism redirecting intellectual life.

Understanding both rise and decline is very important — it proves scientific leadership is built by institutions and values, not by ethnicity. 

Key Definitions

Bayt al-Hikmah (House of Wisdom) is defined as the Abbasid translation and research institute in Baghdad that made Arabic the language of science

Key Points — very important for exams

8th–14th centuries: Baghdad, Cordoba, Cairo, Samarkand — libraries, observatories, hospitals.

Flourishing: patronage, Quranic knowledge-ethic, practical needs (qibla, inheritance), paper, cosmopolitanism.

Decline: lost patronage, rote learning, economic decline, Mongol blow, colonialism.

Review Questions

- ? Name three Golden Age scientific centres and their institutions.
- ? Why is the decline story as instructive as the rise?

Section Summary

Muslim civilization led world science for six centuries because institutions and values supported inquiry — a replicable formula.

Exam Pointers

- Explain the Golden Age: its centres, causes of flourishing, and causes of decline.

Lecture 4: Al-Khwarizmi: Father of Algebra

Learning Objectives

- Explain Al-Khwarizmi's mathematical contributions
- Trace his influence on modern computing

Muhammad ibn Musa al-Khwarizmi (c. 780–850), working in the House of Wisdom, wrote the foundational text of algebra — the very word algebra comes from his book *Al-Kitab al-Mukhtasar fi Hisab al-Jabr wal-Muqabala* (The Compendious Book on Calculation by Completion and Balancing). He systematized solving linear and quadratic equations, giving mathematics its most practical branch.

His second immortal contribution was popularizing the Hindu-Arabic numeral system — including zero — through his arithmetic treatise; the Latin West learned its numerals from his work, and the word algorithm derives from his name, Al-Khwarizmi. Modern computing literally runs on his name.

The exam significance is twofold: algebra as systematic equation-solving began with him, and the numeral system enabling all modern calculation reached the world through his exposition. When students write algorithms, they invoke a Muslim mathematician of Baghdad. 

Key Definitions

Algebra is defined as the branch of mathematics systematized by Al-Khwarizmi for solving equations

Algorithm is defined as a step-by-step computational procedure — the word derives from Al-Khwarizmi's name

Key Points — very important for exams

Al-Jabr wal-Muqabala: systematized linear and quadratic equation-solving — algebra begins here.

Popularized Hindu-Arabic numerals including zero; the West learned them from his books.

Algorithm = Latinized Al-Khwarizmi: his name runs inside every computer program.

Review Questions

- ? What does al-jabr mean?
- ? How did Al-Khwarizmi's name enter computer science?

Section Summary

Algebra, modern numerals and the algorithm — three foundations of the digital age — flow from one Baghdad scholar.

Exam Pointers

→ Describe Al-Khwarizmi's contributions to algebra, numerals and algorithms.

Lecture 5: Muslim Contributions to Medicine

Learning Objectives

- Describe Muslim medical achievements
- Explain their method and influence

Ibn Sina (Avicenna, 980–1037) wrote *Al-Qanun fi al-Tibb* (The Canon of Medicine), a million-word encyclopedia systematizing all known medicine: anatomy, disease classification, pharmacology, clinical trials methodology and quarantine principles. Used in European universities until the 17th century, it was among the most influential books in medical history.

Al-Zahrawi (936–1013) of Cordoba, the father of surgery, wrote the 30-volume *Al-Tasrif* describing 200+ surgical instruments — many still recognizable in modern operating theatres — and pioneering techniques in cauterization, lithotomy and obstetrics. His illustrations made surgery teachable.

Other giants: Al-Razi (Rhazes) distinguished smallpox from measles clinically and wrote on pediatrics and medical ethics; Ibn al-Nafis discovered the pulmonary circulation of blood three centuries before Harvey. The pattern is consistent: Muslim physicians combined Greek theory with systematic clinical observation — the method of modern medicine.

Key Definitions

Al-Qanun fi al-Tibb (The Canon of Medicine) is defined as Ibn Sina's medical encyclopedia, a standard European university text until the 17th century

Key Points — very important for exams

Ibn Sina's Canon: the complete medical encyclopedia; Europe's textbook for 600 years.

Al-Zahrawi: father of surgery — 200+ instruments, illustrated techniques still recognizable.

Al-Razi: clinical distinction of smallpox/measles; Ibn al-Nafis: pulmonary circulation before Harvey.

Review Questions

? Why was the Canon so influential?

? Name two surgical innovations of Al-Zahrawi.

Section Summary

Muslim physicians built clinical, experimental medicine — encyclopedias, surgery and discoveries Europe later inherited.

Exam Pointers

→ Describe the contributions of Ibn Sina, Al-Zahrawi, Al-Razi and Ibn al-Nafis to medicine.

Lecture 6: Ibn al-Haytham: Founder of Experimental Optics

Learning Objectives

- Describe Ibn al-Haytham's optical discoveries
- Explain his experimental method

Ibn al-Haytham (Alhazen, 965–1040) is the strongest Muslim candidate for the title of first true scientist. His *Kitab al-Manazir* (Book of Optics) demolished the Greek emission theory of vision (eyes sending

out rays) and proved that vision results from light entering the eye — demonstrated with dark-room (camera obscura) experiments, controlled and repeatable.

His method was the breakthrough: he combined physical experiments with mathematical proof, stated hypotheses explicitly, and designed tests to falsify them — the complete experimental method, six centuries before the European scientific revolution. He also contributed to astronomy, mathematics and the psychology of visual perception.

For exams, the formula is: problem (theories of vision) → method (controlled experiment + mathematics) → result (intromission theory of vision; camera obscura) → significance (experimental method established). Ibn al-Haytham proves the scientific revolution had Muslim foundations.

Key Definitions

Intromission theory of vision is defined as Ibn al-Haytham's theory, proved experimentally, that vision results from light entering the eye

Key Points — very important for exams

Refuted emission theory; proved light enters the eye — via camera obscura experiments.

Method: explicit hypotheses, controlled tests, mathematical proof — the full experimental method.

Significance: the scientific revolution's method was demonstrated in 11th-century Cairo/Basra.

Review Questions

? How did Ibn al-Haytham prove the intromission theory?

? Why is he called the first true scientist?

Section Summary

Optics gave the world its first complete experimental scientist — hypothesis, controlled test, mathematical proof.

Exam Pointers

→ Explain Ibn al-Haytham's method and discoveries in optics.

Lecture 7: Astronomy, Chemistry and Geography

Learning Objectives

- Describe Muslim achievements in astronomy
- Explain contributions to chemistry and geography

Muslim astronomers preserved, corrected and extended Greek astronomy. Al-Battani (858–929) refined the solar year, catalogued stars and improved trigonometric methods; his measurements were used by Copernicus. Al-Biruni (973–1048) measured the Earth's radius with remarkable accuracy and debated the Earth's rotation centuries before Galileo.

The Maragha observatory (13th century) under Nasir al-Din al-Tusi developed the Tusi couple — a mathematical device resolving planetary motion problems — which appears, uncredited, in Copernicus's work. Ulugh Beg's Samarkand observatory (15th century) produced the most accurate star catalogue before telescopes.

In chemistry, Jabir ibn Hayyan (Geber) systematized experimental techniques — distillation, crystallization, calcination — and classified substances; the word chemistry itself flows through Arabic al-kimiya. In geography, Al-Idrisi's world maps and Ibn Battuta's travels expanded mankind's knowledge of the Earth. The pattern across fields: preserve, test, correct, extend.

Key Definitions

Tusi couple is defined as Al-Tusi's mathematical device for planetary motion, later appearing in Copernicus's work

Key Points — very important for exams

Astronomy: Al-Battani's measurements, Al-Biruni's Earth radius, Tusi couple → Copernicus, Ulugh Beg's star catalogue.

Chemistry: Jabir's experimental techniques and classification — al-kimiya to chemistry.

Geography: Al-Idrisi's maps, Ibn Battuta's travels — pattern: preserve, test, correct, extend.

Review Questions

- ? How did Muslim astronomy influence Copernicus?
- ? What were Jabir ibn Hayyan's contributions?

Section Summary

From star catalogues to distillation, Muslim scholars measured, mapped and systematized the physical world.

Exam Pointers

→ Survey Muslim contributions to astronomy, chemistry and geography with key figures.

Lecture 8: Why Muslim Science Declined

Learning Objectives

- Analyse the decline of Muslim science
- Evaluate competing explanations

The causes of scientific decline are debated, and exams reward nuanced answers. External blows: the Mongol sack of Baghdad (1258) destroyed libraries; the Reconquista ended Andalusian science; European colonialism later subordinated Muslim intellectual life. But internal causes mattered more: the fragmentation of patronage as empires decayed, the shift in many madrasas from inquiry to rote transmission, and occasional theological suspicion of philosophy (though figures like Al-Ghazali are

often misread — he critiqued metaphysics, not science).

Economic historians add: as trade routes shifted and the Muslim world's relative wealth declined, the surplus funding research dried up. Science follows funding — a materialist but powerful explanation. The Ottoman and Mughal empires maintained military technology but did not institutionalize the research university.

The very important lesson: decline was not caused by Islam — the same religion presided over the rise. It was caused by the loss of the institutions, patronage and values that the rise required. Civilizations choose, by policy, whether to sustain inquiry.

Key Definitions

Decline debate is defined as the scholarly debate over whether theological or institutional-economic factors ended Muslim scientific leadership

Key Points — very important for exams

External: Mongols (1258), Reconquista, colonialism — real but insufficient alone.

Internal: lost patronage, rote-learning madrasas, economic decline drying research funding.

Key insight: the same Islam presided over rise and decline — institutions and policy, not religion, decided.

Review Questions

? Was Al-Ghazali responsible for the decline? Argue with evidence.

? Why does the funding explanation carry weight?

Section Summary

Science needs sustained institutions and patronage; when those failed, leadership passed — regardless of faith.

Exam Pointers

→ Analyse the causes of the decline of Muslim science, weighing internal and external factors.

Lecture 9: Muslim Responses to Modern Science

Learning Objectives

- Describe modern Muslim positions on science
- Evaluate the Islamization of knowledge project

The 19th–20th century Muslim encounter with modern science produced three broad responses. Rejectionists saw Western science as inseparable from colonialism and secularism and retreated to transmitted learning. Modernists (Sir Syed Ahmad Khan, Muhammad Abduh) argued that the Quran commands the study of nature and that modern science continues the Muslim scientific tradition — Sir

Syed founded Aligarh to prove it.

A third response, associated with thinkers like Ismail al-Faruqi and Seyyed Hossein Nasr, sought the Islamization of knowledge: accepting modern science's findings while critiquing its materialist philosophy and grounding research in Islamic metaphysics and ethics. Pakistan's own science policy debates — from Abdus Salam's Nobel-winning physics to current higher-education reforms — play out within these positions.

For exams, map thinkers to positions with one line each, and note the consensus that emerged: Muslims must master modern science (a communal obligation, fard kifayah) while contributing an ethical framework for its use — the position this course adopts.

Key Definitions

Fard kifayah is defined as the communal obligation in Islamic law to maintain essential expertise, including scientific expertise

Key Points — very important for exams

Rejectionists: science as colonial/secular — retreat; Modernists (Sir Syed, Abduh): Quran commands nature-study.

Islamization of knowledge (Faruqi, Nasr): accept findings, critique materialist philosophy, ground ethics Islamically.

Emerging consensus: mastering science is fard kifayah — a communal duty.

Review Questions

- ? Contrast Sir Syed's and the rejectionists' positions.
- ? What does fard kifayah imply for science policy?

Section Summary

Muslim thought moved from rejection through embrace to critical engagement — mastering science while moralizing its use.

Exam Pointers

- Describe Muslim responses to modern science: rejectionist, modernist, Islamization positions.

Lecture 10: Science in Pakistan: Achievements and Challenges

Learning Objectives

- Describe Pakistan's scientific landscape
- Propose science policy measures

Pakistan's scientific landscape mixes achievement with underinvestment. Abdus Salam — Pakistan's only Nobel laureate (Physics, 1979, electroweak theory) — founded the International Centre for

Theoretical Physics and championed science in the developing world; his legacy poses the question of how Pakistan treats its scientists. SUPARCO, PAEC and agricultural research institutes (notably in wheat and cotton) show state capacity; IT exports and startups show private dynamism.

The constraints are well documented: R&D; spending below 0.3 percent of GDP, weak university–industry links, brain drain, and rote-heavy schooling that under-trains inquiry. Higher Education Commission reforms expanded PhD production, but quality and relevance lag quantity.

The policy agenda follows from the course's historical lesson: sustained patronage, research universities with real autonomy, industry-linked funding, science in the school curriculum as inquiry not memorization, and diaspora engagement. The Golden Age formula — patronage plus institutions plus values — applies unchanged.

Key Definitions

Abdus Salam is defined as Pakistan's 1979 Nobel laureate in Physics for electroweak unification theory

Key Points — very important for exams

Achievements: Abdus Salam (Nobel 1979), PAEC/SUPARCO, agri-research, IT exports.

Constraints: R&D; <0.3% of GDP, weak industry links, brain drain, rote schooling.

Agenda: patronage, autonomous research universities, industry funding, inquiry-based schooling.

Review Questions

? What was Abdus Salam's scientific contribution?

? List three constraints on Pakistani research.

Section Summary

Pakistan has scientific talent and some institutions; it needs the sustained patronage and inquiry culture that built past golden ages.

Exam Pointers

→ Assess Pakistan's scientific achievements and constraints; propose a policy agenda.

Lecture 11: Islamic Bioethics: Principles and Cases

Learning Objectives

- State Islamic bioethical principles
- Apply them to modern cases

Modern science raises ethical questions Islam is well-equipped to address. The governing principles: the sanctity and dignity of human life, the trustee (khalifah) responsibility toward creation, the intention (niyyah) behind research, and the jurisprudential maxims — notably preventing harm (darar) takes

precedence over securing benefit, and necessity permits exceptions.

Applied cases: organ transplantation is broadly permitted by Muslim jurists given consent and need; human cloning is prohibited (violates lineage and dignity); genetic screening and therapy are permitted for treatment but not for enhancement or designer selection; end-of-life care balances the sanctity of life against the refusal of futile treatment.

The method matters for exams: identify the issue, apply the principles (sanctity, trusteeship, no-harm, intention), note scholarly consensus and disagreement, and conclude. Islamic bioethics does not simply say yes or no — it reasons from principles to rulings, exactly as the course models.

Key Definitions

Prevention of harm (darar) is defined as the Islamic legal principle that preventing harm takes precedence over securing benefit

Key Points — very important for exams

Principles: sanctity of life, khalifah trusteeship, niyyah, harm-prevention maxim.

Rulings: organ transplant permitted (consent); cloning prohibited; gene therapy for treatment yes, enhancement no.

Method: principles → scholarly reasoning → ruling — ethics as disciplined reasoning, not slogans.

Review Questions

- ? How does the no-harm maxim apply to genetic enhancement?
- ? Why is organ transplant permitted but cloning not?

Section Summary

Islamic bioethics reasons from revelation-based principles to rulings on medicine's hardest questions.

Exam Pointers

→ Apply Islamic ethical principles to organ transplant, cloning and genetic testing.

Lecture 12: Islam and the Environment

Learning Objectives

- State Islamic environmental principles
- Apply them to modern ecological crises

Islamic environmental ethics rests on khilafah (trusteeship): humans are stewards, not owners, of the Earth, and will answer for its care. The Quran forbids corruption on Earth (fasad) after its setting in order, and the Prophet forbade wasteful use of water even at a flowing river — a striking image for conservation. Planting a tree is counted as charity.

Applied to modern crises: climate change is a collective fasad demanding collective repentance and action — Muslim-majority states' climate policies and Islamic declarations on climate (e.g. the 2015 Islamic Climate Declaration) invoke exactly this theology. Water conservation, anti-littering and wildlife protection all find direct scriptural support.

For exams, connect three levels: theology (trusteeship, anti-fasad), Prophetic practice (water, trees, animals), and policy (climate action, conservation law). Environmental care in Islam is worship with ecological consequences — a powerful, exam-ready formulation. ☰

Key Definitions

Khilafah (trusteeship) is defined as the Quranic concept of humans as stewards answerable for the Earth's care

Key Points — very important for exams

Khilafah: stewardship, not ownership — answerable care of Earth.

Quran forbids fasad (corruption); Prophet forbade wasting water even at a river.

Climate action and conservation are religious duties, not just policy options.

Review Questions

? What is fasad and how does it relate to pollution?

? Give two Prophetic teachings supporting conservation.

Section Summary

Trusteeship theology makes environmental care an act of worship — Islam's green charter.

Exam Pointers

→ Explain Islamic environmental ethics and apply it to climate change and conservation.

Lecture 13: Islam, Technology and Artificial Intelligence

Learning Objectives

- Apply Islamic ethics to emerging technology
- Propose a Muslim engagement agenda for AI

Artificial intelligence and digital technology pose new questions. Islam's framework evaluates technology by purpose and effect: tools that serve justice, knowledge, health and human welfare are welcome; those that enable oppression, deception or harm are not — the technology is judged, not feared. AI in medicine, education and disaster relief clearly serves benefit (maslahah).

Specific concerns: algorithmic bias (unjust discrimination — explicitly condemned), deepfakes and misinformation (lying and slander, grave sins), autonomous weapons (the decision to take life must remain morally accountable), and privacy (the Quran forbids spying and suspicion). Data ethics in

Islam begins with the dignity and privacy of the believer.

The constructive agenda: Muslim societies should participate in shaping AI governance — through research, ethical standards and policy — rather than merely consuming others' technologies. The course's closing argument: the civilization that gave the world algebra owes the world ethical algorithms.

Key Definitions

Maslahah is defined as the Islamic legal concept of public benefit used to evaluate new technologies

Key Points — very important for exams

Criterion: purpose and effect — serve welfare yes; enable oppression/deception no.

Concerns: algorithmic bias (injustice), deepfakes (lying), autonomous weapons (moral accountability), privacy.

Agenda: Muslims must help govern AI, not just consume it — ethical algorithms as civilizational duty.

Review Questions

- ? How would Islamic ethics judge a biased hiring algorithm?
- ? What Quranic principles protect digital privacy?

Section Summary

New technologies are judged by Islamic ethics of justice, truth and dignity — and Muslims should help write the rules.

Exam Pointers

→ Evaluate AI and digital technology from an Islamic ethical perspective.

Lecture 14: Conclusion: Five Theses on Islam and Science

Learning Objectives

- Synthesize the course argument
- Prepare structured exam answers

This course's argument can be stated in five theses. One: Islam commands the study of nature — the conflict narrative is foreign to it. Two: Muslim civilization demonstrated this by leading world science for six centuries through patronage, institutions and values. Three: decline came from losing those supports, not from religion. Four: modern science must be mastered as a communal duty, with critical ethical engagement. Five: contemporary issues — bioethics, environment, AI — are fields where Islamic principles offer genuine guidance.

For exam preparation, organize answers historically (scripture → Golden Age → decline → modern responses → contemporary issues) and always pair claims with evidence: a verse, a scholar, a date, a book. Examiners reward the student who can move from Al-Khwarizmi's algebra to AI ethics in one coherent narrative.

The final personal lesson: the first word revealed was Read. A Muslim student's relationship with science should be confident — heir to a scientific tradition — critical — ethically alert — and purposeful — seeking knowledge to benefit mankind.

Key Definitions

Five theses (course summary) is defined as the course's central claim that Islamic civilization's scientific leadership is a replicable institutional achievement

Key Points — very important for exams

Islam commands nature-study; Muslims led science for six centuries; decline was institutional.

Mastering modern science is fard kifayah; engage it ethically.

Method for exams: history + evidence (verse, scholar, date) + contemporary application.

Review Questions

? State the five theses in your own words.

? How should a Muslim student relate to science?

Section Summary

From Read to AI ethics: Islam's relationship with science is confident, critical and purposeful — heir, guardian and guide.

Exam Pointers

→ Summarize the course's argument on Islam and science in a structured essay plan.

Glossary of Key Terms

Islamic epistemology of science — the Quranic view that nature is orderly and intelligible, inviting rational investigation as worship

Isnad criticism — the hadith sciences' rigorous grading of reports by narrator reliability — a pioneering method of source criticism

Bayt al-Hikmah (House of Wisdom) — the Abbasid translation and research institute in Baghdad that made Arabic the language of science

Algebra — the branch of mathematics systematized by Al-Khwarizmi for solving equations

Algorithm — a step-by-step computational procedure — the word derives from Al-Khwarizmi's name

Al-Qanun fi al-Tibb (The Canon of Medicine) — Ibn Sina's medical encyclopedia, a standard European university text until the 17th century

Intromission theory of vision — Ibn al-Haytham's theory, proved experimentally, that vision results from light entering the eye

Tusi couple — Al-Tusi's mathematical device for planetary motion, later appearing in Copernicus's work

Decline debate — the scholarly debate over whether theological or institutional-economic factors ended Muslim scientific leadership

Fard kifayah — the communal obligation in Islamic law to maintain essential expertise, including scientific expertise

Abdus Salam — Pakistan's 1979 Nobel laureate in Physics for electroweak unification theory

Prevention of harm (darar) — the Islamic legal principle that preventing harm takes precedence over securing benefit

Khilafah (trusteeship) — the Quranic concept of humans as stewards answerable for the Earth's care

Maslahah — the Islamic legal concept of public benefit used to evaluate new technologies

Five theses (course summary) — the course's central claim that Islamic civilization's scientific leadership is a replicable institutional achievement