ST PETER'S COLLEGE
UNIVERSITY OF OXFORD

College Lectureship in Engineering Science (Structures and Dynamics) (part-time)

Further Particulars

St. Peter's College invites applications for a fixed-term part-time College Lectureship in Engineering Science for a period of one year (1 October 2026 to 30 September 2027).

It is expected that this role will be held alongside other employment or, exceptionally, be held by a postgraduate student. We encourage applications from industry as well as those currently in academia.

St Peter's currently has a teaching partnership with Exeter College and the appointee would be expected to deliver tutorials to students at both colleges. This is a fixed-term role to cover for Prof Adcock's reduction in duties whilst he serves as Senior Tutor. It is expected that the organisation of the subject in St Peter's will change for 2027-28; there may be a possibility of renewal although probably with modified hours and duties.

Full information about St Peter's is available on the College website www.spc.ox.ac.uk.

1. Duties

The person appointed to the post will be expected to teach tutorials and classes covering parts of the following papers:

P3 Structures and Mechanics
A3 Structures, Materials and Dynamics

Further information about the contents of these papers can be found in the Appendix. Tutorials will normally be taught in pairs, with revision and collection classes given to all students in a cohort together.

The main responsibilities of the Lecturer will be as follows

1. To plan and provide tutorial teaching for up to an average of four weighted hours[1] in each week of full term (eight weeks each), based on the problem sheets listed in the appendix, to students at St Peter's College and Exeter College. To deliver revision classes on these topics.

2. To ensure that students receive timely feedback on their work during term, both week by week and in termly reports, and to set and mark internal examinations ('Collections').

[1] Under the College's weighting system for Stipendiary Lecturers, teaching hours are worked out on the basis of teaching students in pairs. Any hours spent teaching larger groups are counted as 1.2 hours, while any hours spent with individual students count as 0.8 hours.)

3. To participate in College admissions interviews or to tutor at the residential St Peter's runs in the Easter period for prospective students from backgrounds under-represented on the course.

4. To undertake academic administration (e.g. the planning and organisation of students' subject options; the endorsement of applications made by students for travel grants and other College assistance; the writing of references, the selection of books for the College Library etc.). The appointee will be expected to play a role in the St Peter's/Exeter teaching team who meet regularly during term to discuss student progress.

5. To undertake pastoral responsibilities in liaison with the College Welfare Team and the tutors in Engineering.

A more detailed guide to tutorial responsibilities and other information will be communicated to the successful candidate by the Senior Tutor following appointment.

2. Selection Criteria

To be successful, candidates will need to show that they meet the following selection criteria and should directly address these points in their application letter:

(i) be a dedicated and inspiring teacher of Engineering, with demonstrable research potential (eg. a doctorate, or substantial progress towards one), and a willingness to contribute to the intellectual culture of Engineering within the College;

(ii) have experience of, or demonstrable commitment to, tutorial teaching and the ability to inspire students both individually and in groups;

(iii) have the potential to discharge willingly and competently the full range of academic administrative duties, besides teaching, upon which the effective operation of Engineering as a subject within the College depends;

(iv) have good communication and interpersonal skills; and

(v) be prepared to undertake admissions training and other training if necessary.

3. Remuneration and conditions

Term of appointment
The period of appointment will be from 1 October 2026 to 30 September 2027.

Remuneration and other conditions
Remuneration will be *pro rata* on the Senior Tutors Committee scale for Stipendiary Lecturers. The current (2025-26) rate for a 4-hour post is £11,270 to £12,446 pa (£939 to £1,037 per month). The appointee will have access to an entertainment allowance of £111 pa.

Pension scheme
The Lecturer will be automatically enrolled in the Universities Superannuation Scheme with effect from the start date of their employment; it is possible subsequently to opt out.

Senior Common Room
The successful candidate will be an associate member of the Senior Common Room and will

be entitled to four free lunches or dinners per week during termtime and two lunches per week during the vacation, provided that the kitchens are open (they are occasionally closed for short periods, normally during the vacation). They will not be a member of the College's Governing Body.

College teaching rooms may be booked as necessary.

4. Application procedure

Candidates should send a letter of application explicitly listing how they meet the selection criteria as well as addressing any other relevant points, together with a curriculum vitae and the name and contact details of one referee electronically to academic.appointments@spc.ox.ac.uk) (contact telephone 01865 278857) by **12noon on 1 July.** The combined letter and CV should be no more than four pages. There is no application form. Candidates should ask their referee to write on their behalf to academic.appointments@spc.ox.ac.uk by the closing date. Where the applicant is a student or postdoc, it is expected that the referee will be their Oxford supervisor. Applicants should have discussed their application with all current supervisors and should confirm they have done this in their application.

Please include the words 'Engineering Lectureship' in the subject line of all email correspondence.

It is expected that shortlisted candidates will be invited to attend an in person interview on the afternoon of 14 July**.** The panel is expected to be Prof Tom Adcock (Chair), Dr Emma Edwards, and Prof Martin Davy.

Informal queries can be addressed to Prof Tom Adcock (thomas.adcock@eng.ox.ac.uk).

St Peter's is an equal opportunities employer.

The appointment will be subject to the provision of proof of the right to work in the UK.

June 2026

Appendix

The appointee will be expected to tutor around 80% of the material in the P3 and A3 papers (Prof Adcock will teach the remaining material). The exact topics each will teach is open to discussion after appointment. To ensure first-year students meet both tutors during Michaelmas Term, Prof Adcock is likely to teach either Statics or Materials and Solid Mechanics.

The relevant syllabuses are below:

P3: STRUCTURES AND MECHANICS

p301: Bending and Torsion (8 Lectures, 2 Tutorial Sheets)

Topics:
• Shear force and bending moment diagrams
• Elastic bending stresses and deflections
• Properties of sections:
  - Neutral axis
  - Second moment of area
• Use of standard solutions and symmetry
• Analysis of simple redundant beams
• Elementary elastic torsion

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p302: Dynamics (8 Lectures, 2 Tutorial Sheets)

Topics:
• Plane kinematics of particles:
  - Rectilinear and curvilinear motion
  - Rectangular, normal–tangential, and polar coordinates
  - Relative motion
• Plane kinematics of rigid bodies:
  - Translation
  - Rotation
  - General plane motion
• Particle dynamics:
  - Newton’s Second Law
  - Work, energy, and power
  - Impulse and momentum
  - Conservation of energy and momentum
  - Impact
  - Central-force motion
• Rigid-body dynamics:
  - Equations of motion
  - Fixed-axis rotation
  - Moment of inertia
  - Work and energy
  - Impulse and momentum
• Simple variable-mass problems (e.g. rockets)

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p303: Materials and Solid Mechanics (12 Lectures, 3 Tutorial Sheets)

Topics:

Materials and Elasticity
• Engineering materials and their properties (including sustainability)
• Atomic bonding and packing
• Elastic properties
• Multi-axial stress and strain
• 3D thermoelastic Hooke's law
• Thin-walled pressure vessels
• Plane stress and plane strain

Plasticity and Deformation
• Nonlinear and inelastic load-extension behaviour
• Nominal and true stress/strain
• Energy of deformation
• Yield strength
• Tensile strength
• Uniform elongation
• Hardness
• Dislocation motion and strengthening mechanisms

Fracture and Fatigue
• Toughness
• Griffith energy criterion for fracture
• Stress intensity factors
• Energy release rate
• Low- and high-cycle fatigue
• S–N curves
• Basquin's law
• Goodman law
• Miner's rule
• Paris' law
• Fatigue micro-mechanisms

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p304: Statics (8 Lectures, 2 Tutorial Sheets)

Topics:
• Equilibrium of force systems
• Internal and external forces
• Pin-jointed frames
• Method of sections
• Method of joints
• Cables and arches
• One-dimensional stress and strain
• Displacements of pin-jointed frames
• Simple redundant systems
• Virtual work for determinate and indeterminate pin-jointed frames

A3: STRUCTURES, MATERIALS AND DYNAMICS

a301: Elastic Analysis of Structures (4 Lectures, 1 Tutorial Sheet)

Topics:
• Virtual work methods for redundant 2D pin-jointed frames, including lack-of-fit problems

• Applications of virtual work to simple beam and curved beam problems
• Stiffness matrix method for redundant horizontal beams, including multi-span beams
• Derivation of 4×4 stiffness matrices
• Equivalent nodal forces
• Assembly and solution of stiffness equations
• Calculation and plotting of bending moment and shear force distributions

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a302: Structural Failure (8 Lectures, 2 Tutorial Sheets)

Topics:
• Failure of structures
• Elastic and plastic bending
• Plastic moment
• Upper bound analysis of beams and frames
• Lower bound checks
• Instability
• Stability defined in terms of energy
• Buckling of struts
  - Euler approach
  - Rayleigh approach
• Imperfections

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a303: Mechanics of Materials (8 Lectures, 2 Tutorial Sheets)

Topics:
• Suffix notation
• Tensors
• Kinematics:
  - Displacement
  - Strain
  - Compatibility
• Traction and stress
• Hooke’s law
• Equilibrium equations
• Transformation of stress and strain
• Stresses and strains in polar coordinates
• Principal stresses and strains
• Maximum normal and shear stresses
• Stress and strain invariants
• Mohr’s circles
• Relationships between elastic constants for isotropic materials
• Tresca yield criterion
• Von Mises yield criterion
• Yield surfaces in 2D and 3D

Applications:
• Boundary conditions for elasticity problems
• Thick-walled cylinders
• Thin plates with holes
• Elastic stress concentrations

• Bursting solution for thick-walled cylinders
• Design for strength and fail-safe operation

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a304: Classical Dynamics (4 Lectures, 1 Tutorial Sheet)

Topics:

Relative Motion
• Kinematics of particles and rigid bodies
• Relative velocity
• Instantaneous centre of zero velocity
• Relative acceleration
• Motion relative to translating and rotating reference frames

Lagrangian Mechanics
• Constraints:
  - Holonomic
  - Non-holonomic
• Degrees of freedom
• Generalised coordinates
• Transformation equations
• Virtual work
• Generalised forces
• Derivation of equations of motion
• d'Alembert's principle
• Kinetic energy
• Potential energy
• Conservative systems
• Lagrangian function
• Small oscillations

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a305: Mechanical Vibrations (4 Lectures, 1 Tutorial Sheet)

Topics:
• Single degree-of-freedom vibrations
• Free vibration
• Forced vibration
• Transient response
• Effect of damping
• Modelling with masses, springs and dampers
• Applications in mechanical engineering
• Vibrations of undamped two- and three-degree-of-freedom systems
• Natural frequencies
• Mode shapes

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a306: Transmission of Motion (4 Lectures, 1 Tutorial Sheet)

Topics:

Gears
• Simple gear trains
• Compound gear trains
• Epicyclic gear trains
• Velocity and torque ratios
• Applications in bicycles and road vehicles

Mechanisms
• Links and joints
• Open and closed kinematic chains
• Degrees of freedom (mobility)
• Four-bar linkage and Grashof's Law
• Slider-crank mechanisms
• Quick-return mechanisms
• Mechanical (robot) manipulators
• Workspace

Relative Motion in Mechanisms
• Vector representation of position, velocity and acceleration
• Particles in a common link
• Coincident particles on separate links
• Reference frames
• Matrix transformations for manipulators

Kinematic Analysis
• Position, velocity and acceleration calculations
• Vector loop equations
• Vector chain equations
• Complex number methods
• Iterative methods