Graduate Programs in Public Policy and Political Economy

Doctor of Philosophy in Public Policy and Political Economy

75 semester credit hours minimum beyond the baccalaureate degree

Faculty

Professors: Brian J. L. Berry, Patrick T. Brandt, Paul Diehl, Lloyd J. Dumas, Euel W. Elliott, Donald A. Hicks, Jennifer S. Holmes, Murray J. Leaf, Richard K. Scotch

Clinical Professor: Linda Camp Keith

Associate Professors: Simon M. Fass, Dohyeong Kim, Clint W. Peinhardt, Idean Salehyan

Clinical Associate Professor: Karl K. Ho

Assistant Professors: Jonas Bunte, Vito D'Orazio

Mission

The mission of the PhD program in Public Policy and Political Economy (PPPE) is to prepare our students for professional positions in research, teaching, and practice in fields related to public policy and political economy, in both academic and nonacademic settings. We prepare students through instruction in social science and public policy concepts, advanced methodological knowledge, applied social research techniques, and professional communication skills. PPPE students and faculty are encouraged to promote an inclusive and diverse environment that is committed to continued scholarship and service.

Objectives

• Students will demonstrate the ability to apply social science and public policy theories and concepts.
• Students will develop competency in advanced methods of social science and public policy research and analysis.
• Students will develop basic skills in professional communication appropriate to the public policy and political economy research and analysis.
Facilities

Students have access to the computing faculties in the School of Economic, Political and Policy Sciences and the University's computer labs. The school has four computing laboratories which house 24-30 computers each that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS and Stata. A geographic information system, the LexisNexis database, and Westlaw are also available for student use. The University's computer labs provide personal computers and UNIX workstations. Many important data and reference materials are also available online via the library and the school's memberships in numerous organizations.

Admission Requirements

The University's general admission requirements are discussed on the Graduate Admission page. The PhD in Public Policy and Political Economy seeks applications from students with a baccalaureate degree from an institution of higher education. An undergraduate grade point average of at least 3.2, a score of 160 Verbal and a score of 148 Quantitative on the GRE, or equivalent score on the GMAT, are desirable. Standardized test scores are only one of the factors taken into account in determining admission. Students should also submit all transcripts, three letters of recommendation, and a one-page essay outlining the applicant's background, education, and professional objectives.

Prerequisites

While there are no specific course prerequisites, entering students will benefit from exposure to undergraduate courses in economics, political science, sociology, calculus, statistics, and research design.

Degree Requirements

The University's general degree requirements are discussed on the Graduate Policies and Procedures page. The PhD in Public Policy and Political Economy requires a minimum of 75 post-baccalaureate graduate semester credit hours. Full-time students can complete the degree in an average of 5 years.

Students must maintain a 3.0 cumulative GPA in their graduate courses in the degree program, and earn a grade of at least 3.0 (B) for all core courses. If placed on probation, students will have one semester to bring their cumulative grade point average to a 3.0 or greater. Any student who receives two Cs will not be allowed to continue in the program.

Students must complete the following:

- 33 semester credit hours of core courses
- 12 semester credit hours of field courses (six semester credit hours in two fields of the student's choice):
The requirements are outlined in further detail below.

I. Major Core Requirements (33 semester credit hours)

Students complete a core sequence of courses as follows:

1. Six semester credit hours of coursework in Government and Public Policy:
   
   PPPE 6347 Proseminar in Political Institutions and American Politics
   PPPE 6329 Ethics, Culture, and Public Policy

2. Six semester credit hours of Theories of Political Economy
   
   PPPE 6301 Political-Economic Theories
   PPPE 6321 Economics for Public Policy

3. Fifteen semester credit hours of Analytical Methods
   
   Methods Core (Algebra-based or Calculus-based)

   Algebra-based series
   
   EPPS 6313 Introduction to Quantitative Methods
   EPPS 6316 Applied Regression
   
   or
   
   Calculus-based series
Students are strongly encouraged to take the calculus-based sequence, which is better preparation for the methods qualifying exam and more advanced methods courses.

Students will also take at least three additional methods from a set of courses approved by the program head or director of graduate studies. Students may obtain a list of those courses from the program office.

4. Six semester credit hours of Research Design

   **EPPS 7313** Descriptive and Inferential Statistics
   **EPPS 7316** Regression and Multivariate Analysis

   Students take a two course introductory sequence in two of the following five fields. The fields and required courses are as follows:

   **Development**
   
   **PPPE 6354** Theories and Issues of Development (Required)
   Select one course from the following:
   
   **PPPE 6335** Institutions and Development
   **PPPE 6343** Global Health Policy
   **PPPE 6352** World Political Economy
   **PPPE 6362** Political Development
   **PPPE 6363** Conflict and Development
   **PPPE 6367** Environmental Economics and Policy
   **PPPE 6370** Political Economy of Natural Resources
   **PPPE 6371** Urban Development
   **PPPE 6372** Faith, Ideology, and Development
   **PPPE 6392** Practice of International Development

   **International Conflict and Security**

   Select two courses from the following:

   **PPPE 6361** Civil Conflict
**International Political Economy**

**PSCI 6309** International Political Economy (required)

Select one course from the following:

**PPPE 6319** Political Economy of MNCs

**PPPE 6352** World Political Economy

**PPPE 6368** Political Economy of Finance

**PPPE 6370** Political Economy of Natural Resources

**PSCI 6316** International Organizations

**Social and Health Policy**

Select two courses from the following:

**PPPE 6313** Human Organizations and Social Theory

**PPPE 6340** Domestic Social Policy

**PPPE 6341** Health Policy

**PPPE 6343** Global Health Policy

**PPPE 6350** Social Stratification

**PPPE 6356** Health and Illness

**Business, Technology, and Innovation**

Select one course from the following:

**PPPE 6359** Political Economy of Economic Development

**PPPE 6365** The Innovation Economy

Select one course from the following:
Students may request that alternative courses be substituted in a particular field with the approval of the Program Head or Director of Graduate Studies. Moreover, students may, in consultation with the Program Head or Director of Graduate Studies, define a new field provided that appropriate coursework is available in a coherent research literature is identified.

III. Area of Specialization (6 semester credit hours)

The student takes at least six semester credit hours of additional coursework in one of the field areas as defined above. The specific required courses are designated by the faculty associated with that field of concentration and may be obtained from the program office. The student completes a dissertation in one of the two fields (see above) and must successfully defend the dissertation before a duly constituted dissertation committee, in accordance with the requirements of the University and the UT System.

IV. Methods Qualifying Exam and Matriculation to the Dissertation Phase

To advance to the dissertation stage of the program, students are evaluated based on a Methods Qualifying Examination (MQE).

The MQE will cover course material from (EPPS 6313 Introduction to Quantitative Methods and EPPS 6316 Applied Regression) and/or (EPPS 7313 Descriptive and Inferential Statistics and EPPS 7316 Regression and Multivariate Analysis), PPPE 6310 Research Design I and PPPE 6342 Research Design II. It is required that full-time (and 6 semester credit hours-a-semester part-time) students take EPPS 6313 or EPPS 7313 and PPPE 6310 the fall semester of the first year and EPPS 6316 or EP S 7316 and PPPE 6342 in spring. The MQE is administered once a year in late April or May. Student performance will be evaluated as unsatisfactory, satisfactory, or excellent. Those failing the exam will be given a second opportunity to pass at the end of the summer. Those failing the MQE for the second time will not be allowed to continue in the program. Part-time students should seek to complete the required methods sequence by spring of their second year; courses noted above should be taken in the same basic sequence.

V. Dissertation Seminar

Students must register for PPPE 8398 Dissertation Seminar for a minimum of one semester after passing the MQE. The aim of the Dissertation Seminar is to assist students in the formulation of a dissertation topic, and prepare a dissertation topic for submission to a dissertation committee, and defense of the proposal before the committee. The Dissertation Seminar can also be taken as an independent study course under the supervision of the student's likely dissertation supervisor. Students seeking advising concerning a suitable dissertation topic or appropriate supervisor are
encouraged to consult with the Program Head or Director of Graduate Studies.

VI. Electives

Students take free electives in areas of interest to fulfill the 75-semester credit hour PhD requirement.

PhD students should note that they are eligible to receive master's degrees offered by the School of Economic, Political and Policy Sciences (EPPS) while they matriculate toward the doctorate. These degrees include the Master of Public Policy and the MS in International Political Economy. Other EPPS master's degrees can be earned as well. Students interested in obtaining one of these degrees should consult the catalog requirements or the graduate advisor. No more than 6 hours of independent study (PPPE 8v01) may be taken, unless approved by the Director of Graduate Studies or Program Head.

Master of Science in International Political Economy

36 semester credit hours minimum

Faculty

Professors: Brian J. L. Berry, Patrick T. Brandt, Paul Diehl, Lloyd J. Dumas, Euel W. Elliott, Donald A. Hicks, Jennifer S. Holmes, Murray J. Leaf, Richard K. Scotch

Clinical Professor: Linda Camp Keith

Associate Professors: Simon M. Fass, Dohyeong Kim, Clint W. Peinhardt, Idean Salehyan

Clinical Associate Professor: Karl K. Ho

Assistant Professors: Jonas Bunte, Vito D’Orazio

Mission

The mission of the Master of Science in International Political Economy is to offer an experience in interdisciplinary education and policy research through activities in graduate education, scholarly and applied inquiry, and professional service. Today, more careers increasingly require international knowledge and skills that transcend the confines of traditional disciplinary training. We prepare students for careers in research, teaching, and practice in a variety of both academic and non-academic public policy and political economy settings. The Master of Science in International Political Economy will develop students' critical skill sets to meet the needs and demands of the international diplomatic and business sectors. These skills include critical thinking, knowledge of multiple cultures and cultural contexts, rigorous research skills, and the ability to communicate effectively in an array of environments. Students will be prepared to advance careers in policy and data analysis, and administrative positions in government, the nonprofit and private
sectors.

Objectives

• Students will demonstrate the ability to apply social science and international political economy theories and concepts.
• Students will develop competency in advanced methods of social science and international political economy research and analysis.
• Students will develop basic skills in professional communication appropriate to international political economy research and analysis.
• Students will develop competency in analysis, evaluation, and research design relevant to social science and international political economy research and analysis.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's computer labs. The school has four computing laboratories which house between 24-30 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS, and Stata. A computerized geographic information system, the LexisNexis database, and Westlaw are also available for student use. The University's computer labs provide personal computers and UNIX workstations. Many important data and reference materials are also available online via the library and school's memberships in numerous organizations.

Admissions Requirement

The University's general admission requirements are discussed on the Graduate Admission page (catalog.utdallas.edu/2016/graduate/admission).

The master's program in International Political Economy seeks applications from students with a baccalaureate degree from an institution of higher education. Although applications will be reviewed holistically, in general, entering students have earned a 3.0 undergraduate grade point average (GPA) (on a 4.0 point scale), and a verbal score of 156 and a quantitative score of 146 on the Graduate Records Examination (GRE). Standardized test scores are only one of the factors taken into account in determining admission. Students should also submit all transcripts, three letters of recommendation, and a one-page essay outlining the applicant’s background, education, and professional objectives.

Prerequisites

While there are no specific course prerequisites, entering students will benefit from exposure to undergraduate courses in economics, political sciences, sociology, college algebra, statistics, public policy, and research design. Students are strongly encouraged to strengthen their foreign language skills.
Degree Requirements

The University's general degree requirements are discussed on the Graduate Policies and Procedures page (catalog.utdallas.edu/2016/graduate/policies/policy).

Students seeking a Master of Science in International Political Economy must complete at least 36 semester credit hours of work in the program. The program has four components:

1. Eighteen semester credit hours of required coursework
2. Twelve semester credit hours of prescribed electives
3. Six semester credit hours of free electives
4. Students must demonstrate a foreign language proficiency equivalent to two years of university-level study in one foreign language before graduation.

Students must maintain a 3.0 cumulative GPA in their graduate courses in the degree program, including core courses. If placed on probation, students will have one semester to bring their cumulative grade point average to a 3.0 or greater. Any student who receives two Cs will no longer be allowed to continue in the program.

I. Major Required Courses: 18 semester credit hours

All students should complete the core courses as soon as possible.

Economic Theory Core (take one course from the following):

- PPPE 6321 Economics for Public Policy
- PPPE 6365 The Innovation Economy

Methods Core (Algebra-based or Calculus-based)

Algebra-based series

- EPPS 6313 Introduction to Quantitative Methods
- EPPS 6316 Applied Regression

or

Calculus-based series

- EPPS 7313 Descriptive and Inferential Statistics
- EPPS 7316 Regression and Multivariate Analysis

Choose one course from the following:

- PPPE 6352 World Political Economy
PSCI 6309 International Political Economy
Choose one course from the following:
PPPE 6319 Political Economy of MNCs
PPPE 6335 Institutions and Development
PPPE 6362 Political Development
PPPE 6368 Political Economy of Finance
PSCI 6309 International Political Economy
PSCI 6316 International Organizations
Choose one course from the following:
PPPE 7V76 Policy Research Workshop in Development Studies
PPPE 6310 Research Design I
EPPS 6352 Evaluation Research in the Economic, Political and Policy Sciences

II. Prescribed Electives: 12 semester credit hours

Students complete 12 semester credit hours of Prescribed Electives. These consist of:

An area concentration in which the student completes two courses (six semester credit hours) in history, advanced language, or area studies courses that address a single region, including Europe, Latin America, or the Middle East/Greater Asia.

A theme concentration in which the student completes two courses (six semester credit hours) in development, international business and public policy, or international conflict and security.

Development

PPPE 6354 Theories and Issues of Development (Required)
Select one course from the following:
PPPE 6335 Institutions and Development
PPPE 6343 Global Health Policy
PPPE 6352 World Political Economy
PPPE 6362 Political Development
PPPE 6363 Conflict and Development
PPPE 6367 Environmental Economics and Policy
PPPE 6370 Political Economy of Natural Resources
PPPE 6371 Urban Development  
PPPE 6372 Faith, Ideology, and Development  
PPPE 6392 Practice of International Development  
Other courses as approved by the Program Head or Director of Graduate Studies  

**International Conflict and Security**

Select two courses from the following:

- PPPE 6361 Civil Conflict  
- PPPE 6369 National and International Security Strategies and Policies  
- PPPE 6363 Conflict and Development  
- PSCI 6300 Proseminar in Comparative Politics and International Relations  
- PSCI 6306 Human Rights and International Law  
- PSCI 7318 Conflict Management  
- PSCI 7330 International Conflict  
- PSCI 7335 Theories of International Relations  
- PPPE 7313 Counterterrorism and Counterinsurgency  

Other courses as approved by the Program Head or Director of Graduate Studies  

**International Political Economy**

- PSCI 6309 International Political Economy (required)  

Select one course from the following:

- PPPE 6319 Political Economy of MNCs  
- PPPE 6352 World Political Economy  
- PPPE 6368 Political Economy of Finance  
- PPPE 6370 Political Economy of Natural Resources  
- PSCI 6316 International Organizations  

Other courses as approved by the Program Head or Director of Graduate Studies  

Courses in both the area concentrations and theme concentrations must have the approval of the Program Head or Director of Graduate Studies. Internships and independent studies may count toward either area or theme concentrations, with the permission of the Program Head or Director of Graduate Studies.
III. Elective Courses: 6 semester credit hours

Students also select an additional six semester credit hours of coursework. Students may select courses from those courses not selected under Major Required Courses.

Master of Public Policy

36 semester credit hours minimum

Faculty

Professors: Brian J. L. Berry, Patrick T. Brandt, Lloyd J. Dumas, Euel W. Elliott, Donald A. Hicks, Jennifer S. Holmes, Murray J. Leaf, Richard K. Scotch

Clinical Professor: Linda Camp Keith

Associate Professors: Simon M. Fass, Dohyeong Kim, Banks P. Miller, Clint W. Peinhardt

Clinical Associate Professor: Karl K. Ho

Assistant Professors: Jonas Bunte, Vito D’Orazio

Mission

The Mission of the Master of Public Policy is to offer students an interdisciplinary graduate education designed to develop skills for careers in which a solid understanding of the public policy process and the analysis and evaluation of public policies are essential. Students will be prepared for analytical and administrative positions and responsibilities in a wide array of professional settings in the public, nonprofit, and private sectors as well as advanced study for careers in research. Specific skills include knowledge of the policy process and related ethical concerns, rigorous research skills that provide students with an essential grounding in statistical and data analysis and research design, and effective communication skills.

Objectives

• Students will understand and analyze the principal policy making institutions and the ways in which they formulate debate and implement public policies at the national, sub-national, and local levels. Students will examine legislative, executive, and non-governmental roles in policy formation at different levels of government. They will analyze the ways in which the various institutions interact and set policy priorities. They will study policy implementation and the interrelated functions of levels of governments, nonprofit and corporate entities in policy implementation.

• Students will learn and apply quantitative skills and economic theories to measure and evaluate public policies. They will learn when to apply appropriate techniques to complex policies. They will demonstrate an understanding of techniques to examine the preferred outcomes of policy
alternatives to advise senior officials. Students will acquire skills in applying statistical measures of projected policy outcomes. Students will learn economic theories and acquire skills in applying those theories appropriately to establish policy objectives and outcomes.

- Students will understand the role of and learn appropriate, rigorous ways to design research to increase knowledge of public policy and citizen welfare. Students will learn ways to quantitatively and qualitatively design research projects that address important public policy questions and concerns.

- Students will learn and understand the unique role of ethical theories and behavior as it applies to the public and nonprofit sectors. Students will understand the ethical obligation of elected and appointed governmental officials to the body politic. Students will understand the functions of internal and public oversight of the formation and implementation of public policies.

- Students will develop expertise in a substantive area of public policy and learn how to effectively communicate new findings and innovative policies to senior decision makers and the general public. Students will study one of three major public policy disciplines - social policy, health policy or the business-government relationship. Students will understand the theories and scientific principles that support these substantive policy areas and the ways in which those theories are tested. Students will understand how these policy areas contribute to the well-being of citizens to enhance the quality of life.

- Qualified students are encouraged to consider the PhD in Public Policy and Political Economy (PPPE). Such students should meet with Program Head or Director of Graduate Studies of PPPE as soon as possible to discuss options.

## Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's computer labs. The school has four computing laboratories which house between 24-30 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS, and Stata. A computerized geographic information system, the LexisNexis database, and Westlaw are also available for student use. The University's computer labs provide personal computers and UNIX workstations. Many important data and reference materials are also available online via the library and the school's memberships in numerous organizations.

## Admissions Requirement

The University's general admission requirements are discussed on the [Graduate Admission page](catalog.utdallas.edu/2016/graduate/admission).

The master's program in Public Policy seeks applications from students with a baccalaureate degree from an institution of higher education. Although applications will be reviewed holistically, in general, entering students have earned a 3.0 undergraduate grade point average (GPA) (on a 4.0 point scale), and a verbal score of 156 and a quantitative score of 146 on the Graduate Records Examination (GRE). Standardized test scores are only one of the factors taken into account in determining admission. Students should also submit all transcripts, three letters of
recommendation, and a one-page essay outlining the applicant's background, education, and professional objectives.

Prerequisites
While there are no specific course prerequisites, entering students will benefit from exposure to undergraduate courses in the economics, political sciences, sociology, college algebra, statistics, public policy, and research design.

Grading Policy
In order to qualify for graduation, students must maintain a minimum 3.0 grade point average in their degree program's core courses plus an aggregate grade point average of 3.0 for all graduate courses taken in the student's degree program at UT Dallas.

Degree Requirements
The University's general degree requirements are discussed on the Graduate Policies and Procedures page (catalog.utdallas.edu/2016/graduate/policies/policy).

Students seeking a Masters in Public Policy must complete at least 36 semester credit hours of graduate coursework in the program. The program has three components:

Students must maintain at least a 3.0 (B) grade point average to graduate.

I. Major Required Core Courses: 21 semester credit hours

Policymaking and Institutions (6 semester credit hours)

- PPPE 6347 Proseminar in Political Institutions and American Politics
- PPPE 6329 Ethics, Culture, and Public Policy

Methodology (Statistics, Research Design, and related courses - 9 semester credit hours)

Methods Core (Algebra-based or Calculus-based)

Algebra-based series

- EPPS 6313 Introduction to Quantitative Methods
- EPPS 6316 Applied Regression

or

Calculus-based series

- EPPS 7313 Descriptive and Inferential Statistics
**EPPS 7316** Regression and Multivariate Analysis

Select one course from the following:

**PPPE 6310** Research Design I

**EPPS 6352** Evaluation Research Methods in the Economic, Political and Policy Sciences

**Economics (3 semester credit hours)**

Choose one course from the following:

**PPPE 6321** Economics for Public Policy

**PPPE 6365** The Innovation Economy

**Research Workshop or Internship (3 semester credit hours)**

A PPPE Policy Research Workshop or internship or substitution as approved by the program head.

II. Prescribed Electives: 9 semester credit hours

Students complete nine semester credit hours in ONE of the following areas of concentration. (Social and Health Policy, Security Studies, Geographic Information Systems, or Analytic Methods). All courses must be approved by the Program Head or Director of Graduate Studies.

**A. Social and Health Policy**

Select two courses from the following:

**PPPE 6313** Human Organizations and Social Theory

**PPPE 6340** Domestic Social Policy

**PPPE 6341** Health Policy

**PPPE 6343** Global Health Policy

**PPPE 6350** Social Stratification

**PPPE 6356** Health and Illness

Other courses as approved by the Program Head or Director of Graduate Studies

**B. Security Studies**

Select two courses from the following:

**PPPE 6361** Civil Conflict

**PPPE 6369** National and International Security Strategies and Policies

**PPPE 6363** Conflict and Development
**PSCI 6300** Proseminar in Comparative Politics and International Relations  
**PSCI 6306** Human Rights and International Law  
**PSCI 7318** Conflict Management  
**PSCI 7330** International Conflict  
**PSCI 7335** Theories of International Relations  
**PPPE 7313** Counterterrorism and Counterinsurgency  
Other courses as approved by the Program Head or Director of Graduate Studies

**C. Geographic Information Systems (GIS)**  
**GISC 6381 (GEOS 6381)** Geographic Information Systems Fundamentals
**GISC 6384 (GEOS 6384)** Advanced Geographic Information Systems  
And one of the following:  
**GISC 5322 (GEOS 5322)** GPS (Global Positioning System) Satellite Surveying Techniques  
**GISC 5324 (GEOS 5324)** 3D Data Capture and Ground Lidar  
**GISC 6301** GIS Data Analysis Fundamentals  
**GISC 6317** GIS Programming Fundamentals  
**GISC 6325 (GEOS 5325)** Remote Sensing Fundamentals  
**GISC 6385 (GEOS 6385)** GIS Theories, Models and Issues  
**GISC 6388** Advanced GIS Programming  
**GISC 7310** Advanced GIS Data Analysis  
**GISC 7360** GIS Pattern Analysis  
**GISC 7361** Spatial Statistics  
**GISC 7363** Internet Mapping and Information Processing  
**GISC 7365 (GEOS 5326)** Advanced Remote Sensing  
Other courses as approved by the Program Head or Director of Graduate Studies

**D. Analytic Methods**  
**EPPS 6324** Data Management for Social Science Research  
**EPPS 6346** Qualitative Research Methods  
**EPPS 6352** Evaluation Research Methods in the Economic, Political and Policy Sciences
**EPPS 7304** Cost-Benefit Analysis

**EPPS 7318** Structural Equation and Multilevel (Hierarchical) Modeling

**EPPS 7344** Categorical and Limited Dependent Variables

**EPPS 7368** Spatial Epidemiology

**EPPS 7370** Time Series Analysis I

**EPPS 7371** Time Series Analysis II

**EPPS 7386** Survey Research

**EPPS 7390** Bayesian Analysis for Social and Behavioral Sciences

**EPPS 7V81** Special Topics in Social Science Research Methodology

Other courses as approved by the Program Head or Director of Graduate Studies

Other concentration areas proposed by the student and approved by the program head.

Students should consult the graduate catalog, and the Program Head or Director of Graduate Studies, for additional information regarding those courses that would best satisfy the "Prescribed Electives" requirement.

**III. Free Electives: 6 semester credit hours**

Students may select six semester credit hours of 6000-level or higher courses. Students may choose courses that are not selected under "Major Required Core Courses" to fulfill this requirement and may choose courses outside the School of Economic, Political and Policy Sciences.

1. Courses that count for multiple concentrations can only be applied to one concentration, and may not be double counted in two concentrations for an individual student or may not count for both a concentration and a core.