Economics—EC

923 Advanced Environmental and Resource Economics
Fall, 3(3-0) Interdepartmental with Agricultural Economics; Forestry; Park, Recreation and Tourism Resources; Resource Development. Administered by Department of Agricultural Economics. RB: (AEC 829 and EC 812A) Advanced economic theory of environmental management and policy. Treatment of externalities and market and non-market approaches to environmental improvement. Topics in conservation and sustainable economic growth. Applications to research and policy.

925 Advanced Natural Resource Economics
Spring, 3(3-0) Interdepartmental with Agricultural Economics; Forestry; Resource Development; Park, Recreation and Tourism Resources. Administered by Department of Agricultural Economics. RB: (EC 812A and AEC 829 and FOR 861) SA, AEC 901H Economic theory of managing nonrenewable and renewable resources, including optimal use, the incentives for use under decentralized markets, and public policy design. Analysis of the co-evolution of economic and ecological systems.

950 Research Seminar in Applied Economics
Spring, 3(3-0) R: Open only to Ph.D. students in Economics.
Current research topics in applied economics.

951 Research Seminar in Economic Theory
Spring, 3(3-0) R: Open only to Ph.D. students in Economics.
Current research topics in economic theory.

952 Research Seminar in Econometrics
Spring, 3(3-0) R: Open only to Ph.D. students in Economics.
Current research topics in econometrics.

992 Advanced Topics in Economics
Fall of odd years, 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. RB: (EC 811A and EC 811B and EC 812A and EC 812B and EC 811A and EC 813B and EC 820A and EC 820B) R: Open only to Ph.D. students in Economics or approval of department. Advanced work in a specialized topic in economics.

999 Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to Ph.D. students in Economics.
Doctoral dissertation research.

EDUCATIONAL ADMINISTRATION

Department of Educational Administration
College of Education

315 Student Leadership Training
Fall, Spring, 3(2-2) Student leadership role, skills, and technique, consistent with the principles and demands of a democratic multicultural society.

800 Organization Theory in Education
Department
Fall, Spring, Summer, 3(3-0) Organizational theory and research applied to educational administration. Topics include comparative organization settings, external environments, organizational effectiveness, and ethics.

801 Leadership and Organizational Development
Spring, Summer, 3(3-0) Interaction of leadership with organizational culture and development within a variety of educational organizations.

802 Building a Learning Organization
Spring, 3(3-0) Disciplines and practices for crafting a learning organization. Examination of Eastern, Western, and Quantum models of organization dynamics. Emphasis on strategies and skills for increasing human capacity.

803 Planning, Budgeting, and Evaluation
Spring, 3(3-0) Planning, budgeting, and evaluation in educational organizations. Topics include needs assessment, funding sources, and processes for estimating costs and revenues.

804 Administration of Human Resources in Education
Fall, Spring, 3(3-0) Tasks of personnel management in schools, colleges, and other educational organizations, including recruitment, selection, orientation, development, compensation, and evaluations. Focus on attracting and retaining a quality workforce in education.

805 Administration in Higher Education
Fall, 3(3-0) Theories, systems, structures and processes of college and universities. Comparison of the organization, leadership, and governance of higher education institutions to other non-profit organizations.

806 Learning Leadership and Organizational Analysis I
Fall, 3(3-0) R: Open only to graduate students in K-12 Educational Administration. Leadership of K-12 schools and associated community organizations. Theory and skills needed to discern organizational dynamics of schools and community. Professional ethics of K-12 school leadership and skills and methods of disciplined reflective practice, applied to issues of leadership practice. Methods of reflection and applications of multiple theories to cases of practice.

807 Learning Leadership and Organizational Analysis II
Spring, 2(2-0) P:M (EAD 806) R: Open only to graduate students in K-12 Educational Administration. Data-based organizational analysis of K-12 schools and school-community relations. Leadership skills to define vision strategies. Case analysis and double-loop learning.

809 Interpersonal Dimensions of Leadership
Spring, Summer, 1(1-0) P:M: (EAD 806 and EAD 807 and EAD 808) RB: (EAD 820 and EAD 821) R: Open only to graduate students in K-12 Educational Administration. Assessment of different approaches to school leadership. School leader as reflective practitioner and effective communicator in school and community contexts.

810 Use of Technology in School Administration
Fall, 3(3-0) Learning and leading in the knowledge age with special focus on the role of technology in educational management, communication, and curriculum and instruction.

813 Education, Development and Social Change
Spring of odd years, 3(3-0) Interdepartmental with Teacher Education. Rise of modern systems of education in developed and developing countries. Education, the state, and national development. Colonial heritage, linkages, and globalization of educational development.

820 Internship in Educational Administration I
Fall, Spring, 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Open only to graduate students in K-12 Educational Administration. Supervised internship in an educational institution focused on school leadership issues.

821 Internship in Educational Administration II
Spring, Summer, 1 to 3 credits. R: Open only to graduate students in K-12 Educational Administration. Supervised internship in an educational and/or community organization focused on school-community leadership issues.

845 Teaching, Learning, and School Restructuring
Spring, 3(3-0) Relationship between school-wide interventions and improvement in classroom teaching: school restructuring and recuiting, strategies for school improvement, approaches to teaching and learning.

850 Issues and Strategies in Multicultural Education
Spring, 3(3-0) Historical, pedagogical, and administrative considerations of multicultural education in K-16 educational settings.

852A Elementary and Middle School Administration
Fall, Summer, 3(3-0) Administration and supervision of elementary and middle schools. Alternative organizational arrangements, curricula, and practices. Problems and strategies for improving K-8 education.
852B  Secondary School Administration  
Fall, Summer. 3(3-0)

853A  Legal, Fiscal, and Policy Environment of Schools  
Fall. 3(3-0)

853B  Schools, Families, and Communities  
Fall. 3(3-0)
Comparative and historical analysis of education within the broader social context. Families, communities, and the private sector. Social problems, social policies, and school practice.

853C  Instructional Supervision  
Spring. 3(3-0) R: (EAD 800)
Supervision and evaluation of teaching and learning, and strategies for improvement of K-12 education.

854  Introduction to Inquiry for Educational Leaders  
Fall. 3(3-0) R: Open only to graduate students in K-12 Educational Administration.
Inquiry and applied research methods and skills to inform school-based decision making for school improvement. Constructing, analyzing, and interpreting student and school-level databases. Evaluating, assessing, and creating strategic instructional and organizational development plans.

855  Research in Educational Administration  
Fall, Spring. 3(3-0) P: M (EAD 854)
Applications of research techniques to educational organizations. Developing research proposals, conducting research, and writing formal papers.

856  Applied Inquiry for Educational Leaders  
Spring. 2(2-0) P: M (EAD 854) R: (EAD 806 and EAD 807 and EAD 808 and EAD 820) R: Open only to graduate students in K-12 Educational Administration.
Research techniques and application to current educational organizations and their associated community issues. Design, implement, and evaluate school-level research projects.

858  Special Education Law  
Fall of even years. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Department of Counseling, Educational Psychology, and Special Education. R: Open only to seniors or graduate students.
Analysis of State and Federal regulations, guidelines and court decisions related to special education and examination of their impact.

860  Concept of a Learning Society  
Fall. 3(3-0)
Learning in the Knowledge Age with special focus on the role of technology as a partner in the learning process and in extending intelligence.

861  Adult Learning  
Fall. 3(3-0) SA: EAD 861A

863  Training and Professional Development  
Fall. 3(3-0) SA: EAD 862A
Design of training and professional development programs for postsecondary education contexts.

864  Adult Career Development  
Spring. 3(3-0) SA: EAD 862B
Psychological, social and institutional elements of careers. Cases and theories of career and adult development in the context of changing conditions of work and learning across the life-span.

865  Policy and Practice in Developmental Education  
Spring of odd years. 3(3-0)
Key policy questions and pedagogical issues in the practice of developmental education in postsecondary institutions. Providers of developmental education. Issues of assessment and placement. Literacy as skill versus social practice. Organizational and curricular approaches.

866  Teaching in Postsecondary Education  
Spring. 3(3-0) SA: EAD 861B
Philosophies and beliefs undergirding teaching strategies. Effective teaching strategies and formal learning environments. Assessment of teaching and of student learning.

867  Case Studies in Educational Leadership  
Summer. 3(3-0)
Case-based learning to examine contemporary K-16 leadership.

870  Foundations of Postsecondary Education  
Fall. 3(3-0)
Historical, philosophical and social forces that shaped development of colleges and universities. Emphasis on higher education in the United States.

871  Collegiate Contexts for Teaching and Learning  
Spring. 3(3-0) SA: EAD 871B
Sociocultural contexts of teaching and learning in collegiate environments. Organizational strategies to improve learning contexts for diverse students.

872  Legal Issues in Higher Education  
Spring. 3(3-0)
Legal aspects of administrative practice in institutions of higher education. Governance, academic freedom, due process, and anti-discrimination.

873  The College Student Experience  
Fall. 3(3-0)
Research, theory, and literature related to student development in the college years.

874  Students Affairs in Collegiate Settings I  
Fall. 3(3-0) SA: EAD 874A
History, development, philosophy, organization and administration of college student personnel as a profession. Needed services, programs and skills.

875  Students Affairs in Collegiate Settings II  
Spring. 3(3-0) SA: EAD 874B
College students as members of groups. Peer and group influence. Impact of diversity on behavior. Professional staff development.

876  Budgeting and Finance in Higher Education  
Spring. 3(3-0) SA: EAD 971C
Fundamentals of higher education budgeting and finance including external sources of funding, internal resource allocation processes, social and economic principles and values regarding the distribution of resources among competing concerns.

877  Program Planning and Evaluation in Postsecondary Contexts  
Fall. 3(3-0) SA: EAD 871A
Planning and evaluating programs for learning in diverse educational contexts.

881  Workshops in Educational Administration  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. Laboratory experiences focused on common supervisory and administrative problems.

882  Seminars in Educational Administration  
Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. Seminars in various fields in K-12 educational administration and in higher, adult, and lifelong education.

890  Independent Study  
Fall, Spring. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Approval of department.
Individual study in an area of K-12 administration or higher, adult, and lifelong education.

893  Professional Development Seminar in Student Affairs  
Fall, Spring. 3(1-0) A student may earn a maximum of 4 credits in all enrollments for this course. P: M (EAD 874) R: Open only to students in the Master of Arts in Student Affairs Administration. Approval of department. SA: EAD 894A
Supervised work experience in student affairs.

894  Laboratory and Field Experiences  
Fall, Spring. 1 to 6 credits. A student may earn a maximum of 9 credits in all enrollments for this course. Supervised graduate practica, observations, internships, or externships in K-12 administration and in higher, adult, and lifelong education.

895  Research Ethics  
Summer. 1(1-0) Interdepartmental with Teacher Education; Counseling, Educational Psychology and Special Education; Kinesiology. R: Open only to graduate students in the Department of Counseling, Educational Psychology and Special Education or Department of Educational Administration or Department of Kinesiology or Department of Teacher Education. SA: PES 895
Identifying and resolving ethical problems in research, including issues related to collegial interactions; authorship, publication, and reviewing practices; data management; ownership of data and intellectual property; conflicts of interest; protection of human and animal subjects; and lab safety and compliance.

899  Master's Thesis Research  
Fall, Summer. 1 to 9 credits. A student may earn a maximum of 15 credits in all enrollments for this course. Master's thesis research.

925  Policy and Practice in Education  
Fall of odd years. 3(3-0) SA: EAD 944
Multiple conceptions of the relationship between policy and practice in K-12 education.
Educational Administration—EAD

928 Proseminar in Educational Policy
Fall. 3(3-0) Interdepartmental with Teacher Education.

931 Qualitative Methods in Educational Research
Fall, Spring. Summer. 4(4-0) Interdepartmental with Teacher Education; Counseling, Educational Psychology and Special Education. Administered by Department of Teacher Education. RB. (CEP 950)
Multiple traditions of qualitative research in education. Theory, research questions and design, data collection and analysis, and reporting. Ethical issues. Appraising qualitative research.

940 Organizational Analysis of Education
Fall. Summer, 3(3-0) RB: (EAD 800)
Theoretical perspectives on schools and universities as organizations. Relationship of organization theory to administrative practices.

941 Administrative Behavior in Educational Organizations
Spring. 3(3-0) RB: (EAD 800)
Concepts and models of leadership, management, and organization as they apply to the administration of educational institutions.

942 Economic Analysis in Educational Policy Making
Spring of even years. 3(3-0) Interdepartmental with Teacher Education.

943 Politics of Education
Fall of odd years. 3(3-0)
Education as a political enterprise. Interplay of federal relations, democratic principles, and contending sources of authority in shaping educational policy and practice.

950A Proseminar I in K-12 Educational Administration
Fall. 1(1-0)
Disciplinary perspectives of K-12 educational leadership and management. Influence of research on leadership practice.

950B Proseminar II in K-12 Educational Administration
Spring. 1(1-0) P.M: (EAD 950A)
Synthesis and analysis of disciplinary perspectives of K-12 educational leadership and management. Influence of research on leadership practice.

951A Educational Finance
Spring. 3(3-0)
Political and economic contexts of educational finance. Role of government and policy criteria. Acquisition and distribution of public resources. Emerging issues in elementary and secondary education. Comparative and international analyses.

951B Planning Change in K-12 Education
Fall, 3(3-0)
Behavioral change processes in educational institutions. Concepts and methods that have been tested by laboratory and field experiences.

951C Educational Law
Spring, Summer. 3(3-0)
Legal aspects of school administration. Governance, compulsory attendance, student discipline, due process, search, free speech rights of students and teachers, church and state, and discrimination law.

952A Externship in Educational Administration
Fall, Spring, 3(3-0) Fall: Given only at various off-campus sites. Spring: Given only at various off-campus sites. A student may earn a maximum of 21 credits in all enrollments for this course.
Current administrative problems and solution strategies in education.

953 Organizational Change in Postsecondary Education
Spring of even years. 3(3-0) R: Open only to doctoral students in the Higher, Adult, and Lifelong Education major.
Theories of organizational change as they apply to postsecondary organizations. Strategies for facilitating organizational change in universities and colleges.

955B Field Research Methods in Educational Administration
Spring. 3(3-0)
Methods used in conducting field studies in educational organizations, with emphasis on interviews, observation, and participant observation.

960 Proseminar in Postsecondary Education
Fall. 3(3-0) R: Open only to doctoral students in the Higher, Adult, and Lifelong Education major.
Questions, trends, issues and resources in higher, adult, and lifelong education. Development of skills in problem identification, literature analysis, and scholarly writing.

963 Leadership in Postsecondary Education
Spring. 3(3-0)
Leadership as a complex social phenomenon in higher, adult, and lifelong educational settings. Interdisciplinary theories of leadership as applied to postsecondary education.

965 Diversity and Equity in Postsecondary Education
Fall. 3(3-0)
Promise, challenge, and management of diversity and equity in higher education. Analysis of data and policy. Management responses and strategies.

966 Students in Postsecondary Education
Spring. 3(3-0) R: Open only to doctoral students in the Higher, Adult, and Lifelong Education major.
Research and theoretical foundations concerning traditional and non-traditional college students. Literature from diverse fields such as higher education, adult learning, and multicultural education. Psychosocial and cognitive development of college students, learning and development across the lifespan, experiences of diverse populations, impact of collegiate environments and structures on students.

967 Policy Development and Analysis in Postsecondary Education
Fall. 3(3-0) R: Open only to doctoral students in the Higher, Adult, and Lifelong Education major.
Higher education policy issues, policy-related research and development approaches.

968 Teaching, Learning, and Curriculum in Postsecondary Education
Spring. 3(3-0) R: Open only to doctoral students in the Higher, Adult, and Lifelong Education major.
Theories and current issues about teaching, learning, and curriculum in postsecondary education. Topics include learning contexts, learners, teachers, the learning process, curriculum.

969 Pedagogical Issues in Postsecondary Education
Fall. 3(3-0) R: Open only to doctoral students in the Higher, Adult, and Lifelong Education major.
Theories of learning for teaching adults in postsecondary contexts. Transformative pedagogy, sociocultural dimensions of teaching and learning, teacher formation and development, learning within technologically mediated environments. Authentic approaches to assessing teaching and learning.

970 Organization and Administration in Postsecondary Education
Fall. 3(3-0) R: Open only to doctoral students in the Higher, Adult, and Lifelong Education major. SA: EAD 970A
Principles and patterns of organization and governance characteristic of colleges and universities. Administrative, trustee, faculty, and student roles.

971 Planning, Evaluation, and Decision Making in Postsecondary Education
Spring of odd years. 3(3-0) R: Open only to doctoral students in the Higher, Adult, and Lifelong Education major. SA: EAD 971B
Concepts, theories and models of planning, evaluation, and decision making in the leadership and management of postsecondary institutions. Application to and usefulness for addressing complex problems facing institutions of postsecondary education.

990 Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 15 credits in all enrollments for this course.
Advanced individual study in an area of K-12 administration or higher, adult, and lifelong education.

991A Special Topics in K-12 Administration
Fall, Spring, Summer. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
Special topics in K-12 administration.

991B Special Topics in Higher, Adult, and Lifelong Education
Fall, Spring, Summer. 3(3-0) A student may earn a maximum of 15 credits in all enrollments for this course.
Special topics in the field of higher, adult and lifelong education.

994 Laboratory and Field Experience in Educational Administration
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to doctoral students.
Supervised advanced graduate practica, observations, internships, or externships in K-12 administration and in higher, adult, and lifelong education.
<table>
<thead>
<tr>
<th>Course Title</th>
<th>Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Co-requisites</th>
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<tbody>
<tr>
<td>201 Circuits and Systems I</td>
<td>Fall, Spring, 3(3-0) P:M: (CSE 131 or concurrently or CSE 231 or concurrently) and (EE 201 or concurrently)</td>
<td>3</td>
<td>EE 100</td>
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<tr>
<td>College of Engineering</td>
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<tr>
<td>202 Circuits and Systems II</td>
<td>Fall, Spring, 3(3-0) P:M: (EE 201) and (EE 205 or concurrently or MTH 235 or concurrently)</td>
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<td>EE 100</td>
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<tr>
<td>Department of Electrical and Computer Engineering</td>
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<tr>
<td>230 Digital Logic Fundamentals</td>
<td>Fall, Spring, 3(3-0) P:M: (CSE 131 or concurrently or CSE 231)</td>
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<td>EE 330</td>
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<tr>
<td>280 Electrical Engineering Analysis</td>
<td>Fall, Spring, 3(3-0) P:M: (MTH 234) or (ECE 201 or concurrently)</td>
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<tr>
<td>291 Circuits and Systems</td>
<td>Fall, Spring, 2(2-0) P:M: (MTH 235 or concurrently or MTH 237 or concurrently)</td>
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<td>Approval of department.</td>
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<tr>
<td>301 Electronic Circuits</td>
<td>Fall, Spring, 3(3-0) P:M: (ECE 202) R: Open only to students in the Department of Electrical and Computer Engineering</td>
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<td>Approval of department.</td>
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<tr>
<td>302 Electronics Laboratory</td>
<td>Fall, Spring, 1(0-3) P:M: (ECE 202) and (ECE 302 or concurrently)</td>
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<tr>
<td>303 Electromagnetics Fields and Waves I</td>
<td>Fall, Spring, 3(3-0) P:M: (EE 202) and (ECE 302 or concurrently)</td>
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<tr>
<td>305 Electromagnetic Fields and Waves II</td>
<td>Fall, Spring, 3(3-0) P:M: (EE 202 or ECE 345) R: Open only to juniors or seniors or graduate students in the Department of Electrical and Computer Engineering</td>
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<tr>
<td>313 Control Systems</td>
<td>Fall, Spring, 3(3-0) P:M: (ECE 302 and ECE 303) R: Open only to juniors or seniors or graduate students in the Department of Electrical and Computer Engineering</td>
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<tr>
<td>320 Energy Conversion and Power Electronics</td>
<td>Fall, Spring, 3(3-0) P:M: (ECE 302 and ECE 303 and ECE 305) SA: EE 320</td>
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<tr>
<td>331 Microprocessors and Digital Systems</td>
<td>Fall, Spring, 4(3-3) P:M: (CSE 231 and ECE 230) R: Open only to juniors or seniors or graduate students in the Department of Electrical and Computer Engineering</td>
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<tr>
<td>345 Electronic Instrumentation and Systems</td>
<td>Fall, Spring, 3(2-3) P:M: (MTH 235 or MTH 237 or MTH 239 or MTH 237)</td>
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<tr>
<td>366 Introduction to Signal Processing</td>
<td>Spring, Summer, 3(3-3) P:M: (EE 202) R: Open only to students in the Department of Electrical and Computer Engineering</td>
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<td>402 Applications of Analog Integrated Circuits</td>
<td>Spring, 4(3-3) P:M: (ECE 302 and ECE 303) R: Open only to juniors or seniors or graduate students in the Department of Electrical and Computer Engineering</td>
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<tr>
<td>405 Electromagnetic Fields and Waves II</td>
<td>Fall, 4(3-3) P:M: (EE 305) R: Open only to juniors or seniors or graduate students in the Electrical Engineering major and to juniors or seniors in the Computer Engineering major</td>
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<td>407 Electromagnetic Compatibility</td>
<td>Spring, 4(3-3) P:M: (ECE 302 and ECE 305 and ECE 366) R: Open only to juniors or seniors or graduate students in the Electrical Engineering major and to juniors or seniors in the Computer Engineering major</td>
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<tr>
<td>410 VLSI Design</td>
<td>Fall, Spring, 4(3-3) P:M: (ECE 302 and ECE 303 and ECE 230) R: Open only to juniors or seniors or graduate students in the Department of Electrical and Computer Engineering</td>
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