

Timothy Michael Chowns

Department of Geosciences, University of West Georgia, Carrollton, GA 30118

- Education** University of Newcastle upon Tyne, England, PhD 1968
University of Leicester, England, BSc 1963
- Experience** 1981 - Present Professor, Geology; University of West Georgia

1976 - 1981 Associate Professor, Geology; West Georgia College

1973 - 1976 Assistant Professor, Geology; West Georgia College

1968 - 1972 Visiting Assistant Professor, Geology; University of Georgia

1966 – 1968 Demonstrator in Geology; University of Newcastle upon Tyne, England
- Courses taught**
- GEOL 1121 Physical Geology
 - GEOL 1122 Historical Geology
 - GEOL 2503 Oceanography
 - GEOL 3003 Field Methods
 - GEOL 3042 Optical Mineralogy
 - GEOL 3053 Sedimentary Petrology
 - GEOL 4074 Regional Applications of Field Geology
 - GEOL 4082 Geologic Problems
 - GEOL 4501 Geology Seminar
- Research** Sedimentology and Stratigraphy; Stratigraphy and Depositional Environments of Paleozoic rocks in the Valley and Ridge Province of the Southern Appalachians, Pre-Cretaceous rocks beneath the Southeastern Coastal Plain. Petrology of Sedimentary Ironstones, Carbonates, Cherts and Evaporites. Coastal Stratigraphy
- Professional affiliations**
- Geological Society of America, (1971 - present) Chairman Southeastern Section, GSA (1991 - 92)

 - Society for Sedimentary Geology (1968 - present)

 - Georgia Geological Society (President 1976 - 1977, Treasurer 1993-present)

Publications

- Chowns, T.M., 1968, Environmental and Diagenetic Studies of the Cleveland Ironstone Formation of Northeast Yorkshire. Unpublished Ph.D. thesis (Geology), University of Newcastle upon Tyne, England.
- Chowns, T.M., 1966, Depositional Environment of the Cleveland Ironstone Series; *Nature*, 211, p. 1286-1287.
- Chowns, T.M., 1970, A Chamosite-Hematite Oolite from the Sequatchie Formation in Northwest Georgia; *Bull. Ga. Acad. Sci.*, Vol. 28, p.19 (Abstract).
- Chowns, T.M., 1971, Stratigraphy of the Ordovician and Silurian Section Exposed in the Ringgold Road Cuts: A Proposed Geological Monument; *Bull. Ga. Acad. Sci.*, Vol. 29, p. 123 (Abstract).
- Chowns, T.M., Elkins, J.E., 1971, Origin of Geodes from the Fort Payne Formation, Woodbury, Tennessee; *Geol. Soc. Amer. Abs. with Programs*, Vol. 3, p. 303 (Abstract).
- Chowns, T.M., 1972, Recurrent Sabkha Facies in the Mississippian of the Eastern Interior, U.S.A.; *Geol. Soc. Amer. Abs. with Programs*, Vol. 4, p. 67 (Abstract).
- Chowns, T.M., 1972 (compiler), Sedimentary Environments in the Paleozoic Rocks of Northwest Georgia; *Georgia Geol. Surv. Guidebook 11 (1972)*, p. 101.
- Chowns, T.M., 1972, Depositional Environments in the Upper Ordovician of Northwest Georgia and Southeast Tennessee; *Georgia Geol. Surv. Guidebook 11*, p. 3-12.
- Chowns, T.M., 1972, Molasse Sedimentation in the Silurian Rocks of Northwest Georgia; *Georgia Geol. Surv. Guidebook, 11*, p. 13-23.
- Frey, R.W., Chowns, T.M., 1972, Trace Fossils from the Ringgold Road Cut (Ordovician and Silurian), Georgia; *Georgia Geol. Surv. Guidebook 11*, p. 24-44
- Chowns, T.M., 1972, Promolasse Sedimentation in Silurian Rocks of the Southern Appalachians; *Geol. Soc. Amer. Abs. with Programs*, Vol. 4, p. 274 (Abstract).
- Chowns, T.M., 1972, Review of "Geologic Reference Sources: a Subject and Regional Bibliography of Publications and Maps in the Geological Sciences; by Dederick C. Ward, Marjorie W. Wheeler, and Mark W. Pangborn, Jr.; *Southeastern Librarian*, Vol. 23, p. 36-37.
- Chowns, T.M., Elkins, J.E., 1974, The Origin of Quartz Geodes and Cauliflower Cherts through the Silicification of Anhydrite Nodules; *Jour. Sedimentary Petrology*, Vol. 44, p. 885-903.
- Chowns, T.M., 1976, Paleogeography of the Pre-Cretaceous surface beneath the Georgia Coastal Plain; A reassessment; *Bull. Ga. Acad. Sci.*, Vol. 34, p. 82 (Abstract).
- Chowns, T.M., 1976, (compiler), Stratigraphy, Structure and Seismicity in Slate Belt Rocks along the Savannah River; *Georgia Geol. Surv. Guidebook 16*, 76, p.
- Waters, J.A., Chowns, T.M., 1977, An Occurrence of Kinkaid Age Pterotocrinus species at Rising Fawn, Georgia; *Georgia Jour. Sci.*, Vol. 35, 83, p. (Abstract).
- Chowns, T.M., 1977, (compiler), Stratigraphy and Economic Geology of Cambrian and Ordovician Rocks in Bartow and Polk Counties, Georgia; *Georgia Geol. Soc. 12th Annual Meeting*, 20 p.
- Chowns, T.M., Waters, J.S., 1978, The Lookout Valley Fault and thinskin thrusting beneath Lookout Mountain, Georgia; *Geol. Soc. Amer. Abs. with Programs*, Vol. 10, p. 165 (Abstract).
- Chowns, T.M., 1978, Pre-Cretaceous Geology beneath Georgia Coastal Plain; *Amer. Assoc. Pet. Geol., Annual Meeting*, p. 55 (Abstract).
- Chowns, T.M., Higgins, M.W., Pickering, S.M., 1978, A New Core from the Felsic Volcanic Terrain beneath the Southeast Georgia Coastal Plain, *Georgia Jour. Sci.*, Vol. 35, p. 92

(Abstract).

- Ortiz, A.S., Chowns, T.M., 1978, A New Reference Section for the Knox Group in Northwest Georgia; *Georgia Jour. Sci.*, Vol. 36, p. 89 (Abstract).
- Sellars, B.D., Chowns, T.M., 1978, Petrology of Ironstones from the Deaton Member of the Lenoir Limestone (Middle Ordovician), Polk County, Georgia; *Georgia Jour. Sci.*, Vol. 36, p. 90 (Abstract).
- Wallace, B., Chowns, T.M., 1978, Calcite and aragonite crystal fabrics in speleothems from Ladd's Quarry, Bartow County, Georgia, *Georgia Jour. Sci.*, Vol. 36, p. 90 (Abstract).
- Lovingood, D.A., Chowns, T.M., 1979, Paleocurrent analysis of Sandstone in Northwest Georgia; *Georgia Jour. Sci.*, Vol. 37, p. 83 (Abstract).
- Reid, B.J., Chowns, T.M., 1979, Depositional environment of algal stromatolites; *Georgia Jour. Sci.*, Vol. 37, p. 83 (Abstract).
- Chowns, T.M., McKinney, F.K., 1981, Depositional facies in Middle-Upper Ordovician and Silurian rocks of Alabama and Georgia: in Frey, R.W., *Excursions in Southeastern Geology*, V. 2, p.323-348, *American Geol. Inst.*
- Chowns, T.M., 1981, Recognition of the Sequatchie Formation (Upper Ordovician) in the Armuchee Ridges of Northwest Georgia, *Georgia Jour. Sci.*, V. 39, p. 65 (Abstract).
- Chowns, T.M., Williams, C.T., 1983, Pre-Cretaceous rocks beneath the Georgia Coastal Plain - regional implications, in Gohn, G.S. (ed.) *Studies related to the Charleston, South Carolina, earthquake of 1886 - tectonics and seismicity*, U.S. Geol. Survey Professional Paper 1113L,42p
- Chowns, T.M., 1983, Paleozoic Florida and the African Connection, *Geol. Soc. Amer. Abstracts with Programs* 1983, V.15, p. 66 (Abstract).
- Chowns, T.M., 1984, Pre-Cretaceous rocks beneath the Coastal Plain of the Southeastern U.S.A.; correlations with west Africa, *Trav. Lab. Sci. Terre, St. Jerome, Marseille (B)*, No. 24, p. 42- 43.
- Chowns, T.M., 1985, Alluvial sedimentation in the Newark Group (Triassic-L. Jurassic) of the subsurface South Georgia Basin, *Geol. Soc. Amer., Abstracts with Programs*, V. 17, p. 66 (Abstract).
- Chowns, T.M., 1986, Petrology of Lower Jurassic Chamosite-Siderite Ironstones from Northeast England, *Amer. Assoc. Petroleum Geol. Bull.*, V. 70, p. 573 (Abstract).
- Carter, B.D., Chowns, T.M., 1986, Stratigraphic and environmental relationships of Middle and Upper Ordovician rocks in northwestern Georgia and northeastern Alabama; in Benson, D.J., and Stock, C.W. (eds.), *Depositional history of the Middle Ordovician of the Alabama Appalachians*; *Alabama Geol. Soc. Ann. Field Trip* 23, p. 33-50.
- Chowns, T.M., 1986, A reinterpretation of the Rome, Helena, and Gadsden faults in Alabama; a preliminary report; in Benson, D.J., and Stock, C.W., (eds.), *Depositional history of the Middle Ordovician of the Alabama Appalachians*; *Alabama Geol. Soc. Ann. Field Trip* 23, p. 51-60.
- Rindsberg, A.K., Chowns, T.M., 1986, Ringgold Gap: Progradational sequences in the Ordovician and Silurian of northwest Georgia; in Neathery T.L. (ed.), *Geol. Soc. Amer. Centennial Field Guide*, V. 6, p. 159-162.
- Thomas, W.A., Chowns, T.M., Daniels, D.L., Neathery, T.L., Glover, L., Gleason, R.J., 1989, The subsurface Appalachians beneath the Atlantic and Gulf Coastal Plains: in Hatcher, R.D., Thomas, W.A., Vide, G.W., (eds.), *The Appalachian-Ouachita Orogen in the United States*, *Geol. Soc. Amer., The Geology of North America*, V. F-2, p. 445-457.
- Chowns, T.M., 1989, Stratigraphy of Major Thrust Sheets in the Valley and Ridge Province of Georgia in Fritz, W.J., (ed.), *Excursions in Georgia Geology*, *Georgia Geol. Soc. Guidebook*, V. 9, No. 1, p.211-238.

- Carter, B.D., Chowns, T.M., 1989, Stratigraphic and environmental relationships of Middle and Upper Ordovician rocks in Northwest Georgia and Northeast Alabama: in Keith, B.D., (ed.), *The Trenton Group (Upper Ordovician Series) of Eastern North America, Deposition, Diagenesis, Petroleum*, Amer. Assoc. Petrol. Geol. Studies in Geology 29, p. 17-26.
- Chowns, T.M., 1989, Record of Paleozoic tectonism in the Valley and Ridge Province of Georgia and Alabama: in *Tectonostratigraphic expression of terrane accretion in the Circum-Atlantic Paleozoic orogens*; Univ. of Georgia, International Geological Correlation Program, Project 233, p. 13-15 (Abstract).
- Chowns, T.M., 1989, Structure and Stratigraphy of the Valley and Ridge Province in Georgia and Alabama: in Dallmeyer, R.D., (ed.), *Tectonostratigraphic expression of terrane accretion in the southern Appalachian orogen: a geotraverse excursion*; Univ. of Georgia, International Geological Correlation Program, Project 233, Guidebook, V. 4, p. 1-1 to 1-19, 2-1 to 2-28.
- Chowns, T.M., Sanders, R.P., O'Connor, B.J., Fridell, M.S., Connell, D.A., 1992, The Knox Group southeast of Graysville, Catoosa County, Georgia: a reference section, *Georgia Jour. Sci.*, V. 5, p. 34-35 (Abstract).
- Chowns, T.M., O'Connor, B.J. (eds.), 1992, Cambro-Ordovician strata in Northwest Georgia and Southeast Tennessee; the Knox Group and the Sequatchie Formation, *Georgia Geol. Soc. Guidebook*, V. 12, No. 1, 157 p.
- Chowns, T.M., Sanders, R.P., Connell, D.A., O'Connor, B.J., Fridell, M.S., 1992, Stratigraphy and sedimentology of the Knox Group at Graysville Gap, Catoosa County, Georgia: in Chowns, T.M., O'Connor, B.J., (eds.), *Georgia Geol. Soc. Guidebook*, V. 12, No. 1, p. 5-38.
- Chowns, T. M., Bolton, J.C., 1993, Sequence stratigraphy of the Red Mountain Formation (Lower Silurian) in Alabama and Georgia, *Geol. Soc. America, Abstracts with Programs*, V. 25, p. A362. (Abstract)
- Chowns, T. M., 1994, Siliceous karst, paleosols and speleothems from the Knox Group (Cambro- Ordovician), Georgia; *Geol. Soc. America, Abstracts with Programs*, v. 26, p. 7-8. (Abstract)
- Chowns, T. M., 1994, Sequence stratigraphy of the Red Mountain Formation (Lower Silurian) in Alabama and Georgia; *Georgia Journal of Science* v. 52, p.50.(Abstract)
- Villella, A.C.V., Chowns, T. M., 1995, Silicified karst and paleosols in lowstand systems tracts of the Knox Group (Cambro-Ordovician) of northwest Georgia: *Georgia Journal of Science* v.53, no.1, p. 36.
- LaTour, T.E., Chowns, T. M., Fritz, W.J., 1995, Geochemistry of Mesozoic sedimentary rocks from the Dunbarton rift basin, SC: evidence for protracted deposition by mass flow: *Geol. Soc America, Abstracts with Programs*, v. 27, no. 6 p. A-254. (Abstract)
- LaTour, T.E., Fritz, W.E., Chowns, T. M., 1996, Geochemical evidence for arid Mesozoic-age climate in GA and SC: *Geol. Soc. America, Abstracts with Programs*, v. 28, no. 2. p.19. (Abstract)
- Chowns, T. M., 1996, Sequence stratigraphy of the Silurian Red Mountain Formation in Alabama and Georgia *in Sedimentary environments of Silurian Taconica* ed. T.W.Broadhead; University of Tennessee, *Studies in Geology* 26, p.31-67.
- Chowns, T. M., Fritz, W.J., 1997, Depositional facies in the concealed Early Mesozoic Dunbarton basin, Savannah River Site, South Carolina: *Geol. Soc. America, Abstracts with Programs*, v.29, no. 3, p. 9.
- Chowns, T. M., 1997, The geology of Georgia; a tale of two oceans: *Fernbank Quarterly*, v. 22, no. 3 & 4, p. 6-11.

- Chowns, T. M., Rollins, R. P., 1998, What importance evaporites in the formation of collapse breccias in the Knox Group of the southern Appalachians?: Geol. Soc. America, Abstracts with Programs, v. 30, no. 4, p. 7. (Abstract).
- Rollins, R. P., Chowns, T. M., 1998, Depositional sequences in Holocene-Pleistocene sediments from vibracores on Jekyll Island, Georgia: Georgia Journal of Science v. 56, p. 53. (Abstract)
- Brett, C. E., Baarli, B.G., Chowns, T. M., Cotter, E., Driese, S., Johnson, M. E., 1998, Early Silurian condensed horizons, ironstones, and sequence stratigraphy in the Appalachian foreland basin: New York Museum of Natural History Bull. 491, p. 89-143.
- Vance, D. J., Chowns, T. M., 1999, Delineation of Pleistocene and Holocene depositional environments in vibracores from Jekyll Island, Georgia: Georgia Journal of Science v. 57, p. 54. (Abstract)
- Chowns, T. M., 1999, Ironstones in the Silurian Red Mountain Formation of the southern Appalachians; insights from sequence stratigraphy and computer models: Geol. Soc. America, Abstracts with Programs, v. 31, no. 3, p. A10. (Abstract).
- Chowns, T. M., Holland, S. M., Elliot, W.C., 1999, An introduction to sequence stratigraphy: illustrations from the Valley and Ridge province in Georgia and Alabama: Georgia Geological Society Guidebook, v. 19, no.1, p. 1-50.
- Chowns, T. M., 1999, Sequence stratigraphy: the basics: Georgia Geological Society Guidebook, v.19, no. 1, p. 1-9.
- Chowns, T. M., 1999, Sequence stratigraphy: illustrations from the Silurian Red Mountain Formation of the southern Appalachians: Georgia Geological Society Guidebook v. 19, no. 1, p. 11-26.
- Kogel, J.E., Pickering, S. M., Shelobolina, E., Yuan, J., Chowns, T. M., Avant, D. M., 2000, Geology of the commercial kaolin mining district of central and eastern Georgia: Georgia Geological Society Guidebook, v. 20, no. 1, 92 p.
- Chowns, T.M., Schultz, B.S., 2002, Beach ridges on the northern end of Jekyll Island, Georgia: Georgia Journal of Science, v. 60, p. 77.
- Chowns, T. M., Schultz, B.S., Griffin, J.R., 2002, Jumping inlets, spits and islands on the Georgia coast, USA: Geological Society of America, Abstracts with Programs, v.34, no. 2, p. A-110.
- Griffin, J.R., Schultz, B.S., Chowns, T.M., 2002, Holocene changes at St. Simons Sound, Jekyll Island, Georgia, USA: Geological Society of America, Abstracts with Programs, v. 35, No 2, p. 349.
- Chowns, T.M., 2002, Origin of sedimentary ironstones in the light of sequence stratigraphy of (Silurian), Birmingham iron ores, Alabama, USA: Geological Society of America, Abstracts with Programs, v. 35, No 6, p. 207.
- Chowns, T.M., 2004, Tectonic loading-unloading as controls on Silurian sequence stratigraphy in the Appalachian foreland basin; Geological Society of America, Abstracts with Programs, v. 36, No 2, p. 89.
- Chowns, T.M., Kath, R.L., 2004, (eds), Paleozoics, northwest Georgia: structure, seismicity, geomorphology, hydrology and economic geology; Georgia Geological Society Guidebook v.24, 90 p.
- Chowns, T.M., Kath, R.L., Groshong, R.H., 2004, Are the Wills Valley, Lookout Valley and McLemore Cove anticlines parts of a duplex? Georgia Geological Society Guidebook v. 24, p.13-23.
- Holloway, J. L., Chowns, T.M., 2005, Sedimentation in Vesicles: interpretation of geopetal fabrics in amygdaloidal agates; Geological Society of America, Abstracts with Programs, v. 37, no. 2, p.11.

- Chowns, T.M., 2006 (ed), Quaternary stratigraphy and depositional environments; Jekyll Island and the Golden Isles Parkway; Georgia Geological Society Guidebook v. 26 108 p.
- Chowns, T.M., Schultz, B.S., Griffin, J.R., 2006, Recent changes on Jekyll Island, Georgia, caused by relocation of Brunswick River; Georgia Geological Society Guidebook v. 26, p. 1-14.
- Chowns, T.M., 2006 (ed), Birmingham ironstone: sequences, deposition and mining history; Alabama Geological Society Guidebook 43 Annual Field Trip, 121 p.
- Chowns, T.M., 2006, Sequence stratigraphy of the Red Mountain Formation; setting for the origin of the Birmingham ironstones; Alabama Geological Society Guidebook 43, Annual Field Trip, p.1-30.
- Chowns, T. M. 2007, Anatomy of an Unconformity; Geological Society of America, Abstracts with Programs v. 39, no. 2, p 8.
- Chowns, T. M. Schultz, B. S, Griffin, J. R., 2007, Changes in inlet location at Jekyll Island, Georgia, related to Holocene transgression and stillstand; Geological Society of America, Abstracts with Programs v. 39, no 2, p. 72.
- J. B. Stogner, T. M. Chowns, 2007, A Paleosol from the Bangor Limestone (Mississippian) near Collinsville, Alabama; Georgia Journal of Science, v. 65, p.42.
- Chowns, T.M., Schultz, B.S., Griffin, J.R., Crook, M.R., 2008, Relocation of Brunswick River and other estuaries on the Georgia, USA coast as a consequence of Holocene transgression; Southeastern Geology v. 45, p. 143-159.
- Chowns, T.M., Stogner J.B., 2008, Relocation of inlets on the Georgia coast: Is Blackbeard Island the southern tip of St. Catherines spit? Georgia Journal of Science, v. 66.
- Chowns, T.M., Stogner J.B., 2008, Is Blackbeard Island on the Georgia coast the southern tip of St. Catherines spit? Geological Society of America Abstracts with Programs v. 40, no. 4 p.72.
- Chowns, T.M., 2008, Stratigraphy and cyclic sedimentation in the Early Ordovician, Upper Knox Group, Polk County, northwest Georgia: Georgia Geological Society Guidebook v. 28, p. 43-53.
- Chowns, T.M., 2008, A new occurrence of Bald Cypress in a paleosol on the Silver Bluff Formation exposed on the beach of Jekyll Island, GA. Georgia Journal of Science, v. 67, no. 1, p. 52.
- Chowns, T.M., (in preparation), Stratigraphy of the Red Mountain Formation in its type area; Alabama Geological Survey.

Research grants

- 1971 Recipient of \$1,500 grant from the U.S. Geological Survey to investigate Silurian stratigraphy and ironstones in northeast Alabama in cooperation with Dr. Richard Shelton, Chief Geologist, U.S. Geological Survey.
- 1973-76 Co-recipient of \$40,000, inter-institutional grant (Emory University, West Georgia College, Georgia Southwestern College) sponsored by the U.S. Geological Survey and Georgia Geological Survey, to investigate Pre- Cretaceous rocks beneath the Georgia Coastal Plain.
- 1986-87 Faculty Research Grant, \$1,000 for "Structural Geology of Coosa Coalfield Area, Alabama." 1987-88
Faculty Research Grant, \$1,000 for "Field trip to West Africa to compare the geology of Mauritania and the Southeastern U.S."

- 1987-88 Grant from Georgia Geological Survey, \$2,250 for "Stratigraphy of the Knox Group (Cambro-Ordovician) near Graysville, Georgia."
- 1989-93 Grant from Georgia Geological Survey, \$17,300 for "Well logs of the Knox Group (Cambro-Ordovician) in Polk County Georgia."
- 1990-91 Faculty Research Grant, \$1,000 for "Geologic mapping in Lookout Valley, Dade County, Georgia."
- 1991-92 W.G.C. Foundation Student Work Program (FSWP) Grant of \$952 for a study of the "Petrology of Limestones and Dolostones from the Knox Group in Polk County, Northwest Georgia."
- 1992-93 W.G.C. Foundation Student Work Program (FSWP) Grant of \$1,350 for a study of the "Petrology of Limestones and Dolostones from the Knox Group in Polk County, Northwest Georgia."
- 1993-94 W.G.C. Foundation Student Work Program (FSWP) Grant of \$1,350 for a study "Petrology of Limestones and Dolostones from the Knox Group in Polk County, Northwest Georgia."
- 1994-95 ERDA Grant No 93045 "Investigation of Triassic Basin Sediments - Savannah River Site", \$26,130.
- 1996-97 Faculty Research Grant, \$750 for study of "Petrology of Middle Ordovician rocks near Dalton, Northwest Georgia".
- 1999-00 Faculty Research Grant, \$680 for research on "A Triassic reptile from South Carolina".
- 2000-01 Faculty Research Grant, \$550 for research on "Origin of breccias from the Maynardville Formation in northwest Georgia"
- 2003-04 Faculty Research Grant, \$1500 for research on "Radiometric dating of sediments from Jekyll Island, Georgia"
- 2008-09 Faculty Research Grant, \$1500 for research on "Is Blackbeard Island on the Georgia coast the southern tip of St. Catherines spit?"
- 2008-09 St. Catherines Island Research Program grant of \$3500 for "Optically stimulated luminescence dating of dune ridges from St. Catherines spit."

Honors

- 1960-63 Essex County Major Exhibition (undergraduate tuition and maintenance scholarship).
1963-66 British Department of Scientific and Industrial Research Scholarship (graduate tuition and maintenance scholarship).
- 1972 Outstanding Teacher in Geology; awarded by geology majors and graduate students at the University of Georgia.
- 1976-77 President, Georgia Geological Society.
- 1987-88 President, Carrollton Optimist Club
- 1989-90 Lieutenant Governor, Georgia District, Optimist International
- 1991-92 Chairman, Southeastern Section, Geological Society of America
- 1994-2009 Treasurer, Georgia Geological Society
- 1996 Teacher of the Year 1996, Chi Omega Sorority, State University of West Georgia
- 1997 Nominee from UWG for Regents' Teaching Excellence Award
- 2001-2 President, Southeastern Section, SEPM (Society for Sedimentary Geology)
- 2008-9 Distinguished Professor, College of Arts & Sciences, University of West Georgia