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Oakwood University Capability Statement

Core Competencies

As an ISO 9001-2015 certified Historically Black College and University (HBCU), Oakwood University's vision to become an academically expansive, self-reliant, industry sustained, and non-tuition driven institution that leads it to raise the bar in education, research, grants, federal contracts and industry markets: In support of this vision Oakwood has developed core competencies in the following areas:

- Contract Acquisition, Project Management, and Human Resource Management
- Providing Student Interns in STEM and Business Programs
- Life Sciences Research
- Evaluation Research
- Engineering and Information Technology support
- Technical Training and Help Desk Support
- Faculty Scientific Research (SMEs)
- Survey Research Design
- Literature Review
- Benchmarking
- Data Analysis (Qualitative and Quantitative)
- CYBER Security
- Leasing & Property Management

CORE COMPETENCIES: RESEARCH

Life Sciences: **(Keywords)** Neuroscience, Jetlag and mood, Sleep-wake cycle, Health disparities, Cancer biology (cervical, prostate, breast, pancreatic), Microbial pathogenesis, Nanotechnology, Bacterial virulence, antimicrobial agents, Molecular microbiology, Signal transduction, Microbial host interactions, Cancer therapeutics, Rapid molecular screening test development, Environmental science, Transcriptomics, Proteomics.

Mathematics, Computer Science, and Engineering: **(Keywords)** Fiber lasers, Laser resonators, Laser systems engineering, Optical fibers, Structured optical fibers, Erbium, Europium, Ions, Matrices, Nanoparticles, Polymers, Quantum communications, Thulium, Near infrared, Phonons, Photovoltaics, Solar cells, Solar Energy, Solar radiation, Ultraviolet

radiation, Ytterbium, Absorption, Nanocomposites, Polymer thin films, Polymers, Pulsed laser deposition, Solar concentrators, Ultraviolet radiation, Amplifiers, Capillaries, Erbium, Fiber amplifiers, Optical amplifiers, Visible radiation, Wavelength division multiplexing, Polymethylmethacrylate, Solar cells, Modes of laser operation, Computing systems, Quantum computing.

Biochemical Engineering: **(Keywords)** Environmental Chemistry, Sunscreen, Water purity, Personal Care Products, Nanotechnology, Plasma research, Plant electrophysiology, Bioelectrochemistry, Interfacial phenomena, Memristors, Memory and learning in plants, Nitrogen fixation, earthquakes detection and prediction.

FACILITIES, EQUIPMENT, AND CAPABILITIES IN RESEARCH LABS:

Life Sciences Laboratories: Available in seven Biology labs is the following equipment for research: DNA sequencers, DNA electrophoresis, Imager for DNA cells and membranes, qRT-PCR, 2D Gel electrophoresis apparatus, PCR machines (2 thermocyclers), microbial incubators, protein electrophoresis equipment and blot modules, microplate readers, electroporator, HPLC, GC-MS, UV-Vis Spectrometers, FT-MNR machine, Cryo system, imager for DNA gels and membranes, Countess automated cell counter, tissue homogenizer, iBright imaging system, Anatomage virtual dissection table.

Life Sciences Capabilities: Genetic quantification and preparation of genetic material, molecular genetics, harvesting nucleic acids, quantifying and analyzing nucleic acids, microbe and nanoparticle research, as well as labs dealing with zebra fish, sea urchins, planaria, and chick development and mouse facility dealing with different transgenic mice.

Mathematics, Computer Science, and ***Engineering Laboratories:*** Available in two Nanotechnology Labs is the following equipment for research: 500-mm-Pro imaging spectrometer, holographic gratings, photomultiplier tube, and PI-Max Digital Intensified CCD Camera system and an Infrared detector, 980 nm and 1550 nm diode lasers equipped with pulsing, 1064 nm pulsed laser, Argon ion, ring dye and 375 nm lasers, light Scattering particle size analyzer, Atomic Force Microscope, X-ray diffractometer, Oscilloscope, Pulse generator and Optical Spectrum Analyzer, UV UV-Visible, Raman, FT-IR, Thin Film, fiber optic CMOS detector and integrating sphere spectrometers, Ball Mill, Fiber splicer, Spin Coater, Solar Simulator &Tunable Light Source Systems, High vacuum DC and RF sputtering system.

Mathematics, Computer Science, and ***Engineering Capabilities:*** Induced laser spectroscopy measurements, exciting earth doped materials with laser, measuring size of small particles, AFM generated images through scanning, bench-top X-ray diffractometer, milling small particles, fiber slicing, deposition measurements of thin films and coatings, sunlight simulators and measurements, spectroscopy scanning operations, measuring electrical signals with sensors.

Biochemical Engineering Laboratories: Available in two Chemistry labs is the following equipment for research: Cold atmospheric pressure radio-frequency He-jet plasma; Atomic spectrometer, KSV surface potential measuring system, UV-Vis spectrophotometers for fast analysis, 4 channel Oscilloscope Langmuir-Blodgett System.

Biochemical Engineering Capabilities: Studies done with Perkin Elmer 1600 Fourier Transform Infrared Spectrophotometer, computers for data acquisition and analysis, Fisher Scientific AG 104, Analytical balances, PXI-NI data acquisition system with a function generator, digital multimeters; Interfacial tensiometers, Faraday cages; Ion-selective electrodes and pH-meters, Solatron potentiostats.

Recent Awards

- Oakwood University recognized in 2020 by the United States Department of Treasury for stellar leadership that contributed to the Treasury and GSA being able to open new frontiers for HBCUs, from GSA schedules to their groundbreaking discussions on the University, and Affiliated Research Center (UARC)
- Oakwood University was recently awarded a 2- year State of Alabama contract to host (provide housing, food, instructional space, and transportation) the newly formed **Alabama School of Cyber Technology and Engineering (ASCTE)** in August 2020. The first class will consist of approximately 100 high school students
- **Supporting major organizations** such as Raytheon, BOEING and agencies such as the Missile Defense Agency and Army Mentor-Protégé Agreements, Oakwood University won the 2016, 2017, 2018 and 2019 Nunn-Perry Awards

Recent Research Awards

- **NSF/HBCU-UP** Program for improving retention and the quality of STEM Education and Research at Oakwood University
- **NSF:** Connecting Plasma universe to Plasma technology
- **NSF**: Alabama ADVANCE partnership for achieving Gender equity in STEM
- **Alabama LSAMP**: Sustainability of Best Practices for STEM Education and Research
- **Lilly Endowment, Inc**.- to help the university's school of theology establish "Diversity, Health, and Social Justice in Community-Based Ministry: Oakwood University's Strategy for Cultivating 21st Century Pastoral Leaders."
- **DOE MSEIP-**to increase the number of female students enrolling in STEM programs in Computer Science and Engineering and enhance career placement of ethnic minorities in these fields.
- **NASA Grant STTR** for UV Protective Coating for Photovoltaic Solar Cells in Space
- The **Department of Defense** projects that include:
    - Nanocolloid Laser with Parity-time Symmetry,
    - New Nanomaterials for High Power fiber Lasers as well as
    - Instrumentation support for Nanophotonic Lasers and for Nan colloid Lasers with Parity –time Symmetry.

Past Performance	Differentiators (bullets)
Over fifteen (15) years of past performance in the Federal and Grant industry: ▪ GSA-Leasing, U.S. Census Bureau ▪ SAIC/NASA ▪ TEC-MASTERS ▪ NORTHROP GRUMMAN ▪ RAYTHEON ▪ S3 ▪ BOEING/NASA ▪ DynCorp	▪ **ISO 9001-2015 Certified** ▪ Responsive systems enable Oakwood to deliver on time and on budget ▪ Qualified Faculty Experts and Researchers ▪ Developed and implemented **a Quality Enhancement Plan & Certification** based on "*Critical Thinking Developed Through Writing*" ▪ Provide Interns with experience in business, finance, marketing, IT, engineering, computer science and research

Company Data	List Pertinent Codes
Oakwood University is Accredited by: • The Southern Association of Colleges and Schools Commission on Colleges Adventist Accrediting Association • Association of College Business Schools Programs • Council on Social Work Education • National Council for Accreditation of Teacher Education • National League for Nursing Accrediting Commission • Over 47 Course Offerings including STEM Programs	• Historically Black College or University (HBCU), Minority Serving Institution (MSI) • Non-profit Organization - 501 c(3) • Private University or College • Dun & Bradstreet (DUNS) – 07-209-5326 • CAGE Code- 5N399 • GS-04P-LAL00725 – GSA Lease • SAM.beta.gov – registered • NAICS Codes 541511,541611,518210,541513,541519,5415, 517110, 611310

Updated: Jan. 20,2022