

our MERCHANDISE



New BELS merchandise has been delivered and will be available at the different stops we make in 2019. Last year we covered the state (more about that on Pages 8 & 9) from top to bottom and nearly side to side. The goal for the new year is to be just as active.

NEED A SPEAKER?

If your university, firm or organization would benefit from a presentation by BELS, we would be happy to join you. We cover a myriad of topics:

- Our identity
- Engineering Ethics
- Land Surveying Ethics
- Continuing education (PDH)
- The investigative process
- ACT 550 / Law Change
- Pathways to Licensure

Please contact Public Information Specialist Griffin Pritchard to make your request. He can be reached via email at: griffin.pritchard@bels.alabama.gov or via phone at 334-242-5568

MAINTAINING YOUR ETHICS

From Page 1

In the BELS Administrative Code – in which updated language became effective earlier in the month of January 2019 – states in 330-X-14.06 (a) (1-15) (paraphrasing select passages): “The engineer or land surveyor shall contribute to the maintenance, integrity, independence and competency of the profession as follows: (2) Participate, directly or indirectly, in any scheme or arrangement attempting the evasion of any provision of the Alabama Law regulating the practice; (5) engage in any conduct that discredits or tends to discredit the profession; (7) Perform any acts which are fraudulent or tend to create a misleading impression; (10) Injure or attempt to injure the professional reputation of another by any means whatsoever. This shall now relieve a professional of the obligation to expose unethical or illegal conduct to the proper authorities.”

Helen Adams-Morales (currently serving as BELS Secretary) added: “I believe a spotlight is on us to conduct ourselves in an ethical manner.

“Also, I do not believe any of us would be board members if we didn’t demonstrate ethical behavior. Therefore, it is very important.”

Near the conclusion of Toander’s article, he makes the point: “Prudent and equitable enforcement should be the goal. In the end, it seems that state boards are in an ever-more precarious balancing act between enforcing rules that have been established for decades or taking a more moderated approach—maybe for no other reason than to avoid potential political conflict. What is in the best interest of the public and profession? Through service on my board, I’ve adopted a more



conservative view. We have rules for a reason, and while the easiest answer is to let some of these infractions pass without action, I believe that weakens the entire system.

“Arguably the rules themselves need to evolve but ignoring the rules that currently exist is done at the peril of not having the backing of law when you need it.”

“Just as we have a moral obligation to serve and protect the ones who have been entrusted to us in life, we as professionals in the industry we serve, have the moral obligation to entrust the integrity of the profession(s) that has afforded us a prosperous way of life,” said Breighner. “We are bound to conduct ourselves, our business practices and professional decisions in a manner that will edify the person we are, our company and the professional we serve.”

In the ASCE publication Ethics: Guidelines for Professional Conduct (a read suggested by Adams-Morales) the ethical

See **Maintaining Your Ethics PAGE 3**

our CONTACTS

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our MISSION

The Alabama Board of Licensure for Professional Engineers and Land Surveyors was established by legislative action in 1935. Its charter is to protect the public by helping to safeguard life, health, and property, and to promote the public welfare by providing for the licensing and regulation of persons in the practices of engineering and land surveying. This purpose is achieved through the establishment of minimum qualifications for entry into the professions of engineering and land surveying, through the adoption of rules defining and delineating unlawful or unethical conduct, and through swift and effective discipline for those individuals or entities who violate the applicable laws or rules.

ethical CONVERSATION

Broadcasting Success

After going more than year without a webinar, BELS hosted An Ethical Conversation in November. The one-hour webinar hosted by Griffin Pritchard was conducted with the goal of providing an Ethics hour to our licensure community. Swapping over from AT&T Connect to Business Hangouts by Google proved to be a move well made as 1,020 individuals signed up. At peak of the live broadcast, 683 individuals (not counting those conducting lunch'n'learns) were watching. Individuals who signed up to attend, but weren't able to watch live, had the ability to watch a replay through Business Hangouts and the webinar has been recorded through YouTube and is currently on our website where it has been viewed 99 times.

The success of the first event utilizing the new system will lead to more webinars and web-based events down the road. In the Spring, BELS is planning to host a webinar focusing on the changes to the Administrative Code that certified in January 2019. An email announcing sign-up will be sent to the active licensees in the days leading up to the event.

Be sure to follow the Board of Engineers and Land Surveyors on Facebook and Twitter for announcements and opportunities to offer feedback as we constantly try to improve and keep our community informed.

MAINTAINING YOUR ETHICS

From Page 2

responsibility conversation begins with the spotlight falling on the elder statesmen and women of the profession ... "the responsibility borne by employers and senior members of the professional to set standards of ethical behavior in their own lives cannot be overstated. It is the responsibility of people in positions of authority and seniority to make their peers and colleagues aware of the need to read the code of ethics often. Further, these mentoring members have an ethical responsibility to model behaviors that others may learn from and to raise questions and engage their peers and colleagues in discussing ethical issues."

Essentially – don't be afraid to have a conversation that brings ethical situations to the light. The more they are discussed, the easier it will be to have a clear understanding of what is expected and required from the people in your employ.

"In our firm," said Breighner of Birmingham's Schoel Engineering, "there is great value placed on ethical behavior in all business dealings. This value extends well beyond our business practice to all aspects of our consulting work. We have

clients that we have had for decades.

"These are clients we have developed personal relationships with and they trust our opinions and guidance as they navigate through the details of a project.

This begins at property acquisition, through multiple stages of design, jurisdictional approvals and permitting, construction and final project as-builts. These clients trust us ... they know our ethics, character and professionalism."

Breighner added that through conducting an ethically responsible and honest business, it's made working with the municipalities a great deal easier.

In the ASCE publication, members are encouraged to utilize the PLUS philosophy when it comes to decision making.

P = Policies: *Does the action serve the best interests of the public and the client? Is the action consistent with ASCE's Code of Ethics and your employer's policies, procedures and guidelines?*

L = Legal: *Is the action compliant with the spirit and the letter of applicable law and regulations?*

U = Universal: *Does it conform to the*

universal principles and values that the professional end your employer have adopted?

S = Self: *Does it satisfy your own personal definition of right, good and just?*

"The preceding guidelines are intended to emphasize the commitment that ASCE and its members have regarding personal integrity and ethical professional conduct."

"The value placed on ethics as well as other attributes that define moral virtue are held in high regard at our firm," Breighner wrote.

"The values placed on business and professional practices are no different today than the day I was sworn in as a board member. Core values, such as ethics, professional and integrity begin with each person and is cultivated throughout the company by the actions of the leadership."

For a deeper dive into the ethics section of the BELS code, visit bels.alabama.gov and click on the webinar link.

GREYSCALE



Marc Barter

Professional Engineer

Scope of Services

Additional work and study by the Board will be needed to reconcile the charge the board has of protecting the public, and the profession has of protecting the interest of its stakeholders

Requirements to complete a job remains key difference between professions

During the last legislative session, the law governing the licensing of engineers and land surveyors was changed with a major rewrite resulting in the decoupling of the exam from the experience requirements, increasing the board from seven to nine by adding two new public members, and changing the education requirements for surveyors.

While these changes were significant, none was more significant than authorizing of the board to require engineers and land surveyors to participate in a quality-based selection process when vying for work.

This change lifted the cloud of the Supreme Court decision regarding the North Carolina dentist and its relationship to violations of the Sherman Antitrust Act. With the passing of the new law, the board is acting under “state action immunity” which is required to keep from running afoul of the Federal Trade Commission.

Much has been written, debated and argued about QBS; very little is left to be said. There is still much to be explained.

Why QBS? Why not bid engineering or land surveying?

Other professions allow bidding.

Many do not, but, many do.

What makes engineering and land surveying different?

The answer is simple: Scope of services.

The most compelling argument for not bidding engineering work is the scope of services required to complete a job.

My question to any client regarding bidding is: “Bid what?

What is it you want me to bid?”

As a structural engineer I can directly relate my time to the quality of my services and the quality of services to the economy of my solutions to their problems.

There is no such thing as a typical project, typical client or standard solution. Some clients need less services. Some clients need more.

Many years ago I used to work with an architect, a Georgia Tech graduate, who would begin the project with providing a column layout, building, and wall sections and draft specifications. In today’s work environment, we are lucky to get this information by the end of the project.

Which client requires the higher fee?

It is very difficult to set a scope of work in such detail that a competitive price can be provided. Fees provided to many clients are a big guess. How many meetings and revisions will be required. What level of experience will their project manager have, if any? How cooperative will the client be in sending the information needed to complete the project?

Will you constantly be exposed to changes?

Contracts are great, but if you really need to enforce one, you will likely lose money, even if you win the argument, and you will surely lose the client. It’s not to say that a biddable scope can’t be developed. It’s just that very few clients would ever spend the money to develop one.

Large industrial projects are typically developed by in-house engineering staffs or consultants, and then the engineering is

our LEADERSHIP



**Nathan Johnson, PLS/PE
Chair**



**Randall Whorton, PE
Vice Chair**



**Helen Adams-Morales, PE
Secretary**

our LICENSEE COMMUNITY



**ASPLS
District 1
Director
Tony Manary
walks an
eighth-grade
student
through
the process
of taking
a distance
measurement
as part of the
Endless
Opportunities
Career Fair.**

The Tennessee Valley Professional Land Surveyors ASPLS Chapter recently participated in the Decatur-Morgan County Chamber of Commerce Endless Opportunities Career Fair. The event introduced upwards of 3,000 eighth-graders from Lawrence, Limestone and Morgan counties to different professions. The TVPLS (represented by Rusty Blackwell, Tony Manary, Lee Greene, Jr., and Shawn Harris) were able to meet with the different students and talk with them about their chosen profession along with what it takes to be a Professional Land Surveyor and the rewards and benefits from being involved.

If your organization participates in events throughout the year, let us know. Please submit the item, with a clear photo and event description, to griffin.pritchard@bels.alabama.gov for future use on social media and in newsletters.

SCOPE OF SERVICES

From Page 4

competitively procured.

This is a process that is not likely to change significantly and the Board is aware that a hard and fast no-bid rule presents a problem to those firms that must exist in this market.

Additional work and study by the Board will be needed to rectify the charge the board has of protecting the public and that the profession has of protecting the interest of its stakeholders.

Regardless of the client's selection process, the engineer or land surveyor's ethical canons require participation in a process that does not rely on price. You are allowed to negotiate a fee, but not participate in simultaneous negotiations between the client and other professionals.

For those engineers or land surveyors that are on the RFP side of the equation, your participation in the soliciting of bids violates the QBS provisions listed in the Law and explained in the Administrative Code and is subject to disciplinary action.

While your employer may insist on competitively bidding professional services, that employer needs to understand the jeopardy that you can be placed in and the professional stigma associated with having been found guilty of violating the Code of Ethics.

ENFORCEMENT ACTIONS

Nov. 14 BELS Meeting

2017-29-C: Systems By Design Inc.

An investigation determined Systems By Design Inc, an un-certificated firm, designed and installed a fire alarm system for a Head Start/Pre-K Center, without employing an Alabama licensed professional engineer and obtaining a certificate of authorization that would authorize it to offer or provide engineering services. The firm agreed to a Consent Order that required it to cease and desist the offer or the providing of engineering services in the State of Alabama until it employs an Alabama licensed professional engineer and has obtained a certificate of authorization from the Board, to pay the Board \$400 for the cost of the investigation, to pay the State of Alabama General Fund a \$1,000 civil penalty, and the Order to be a public record.

2018-02-C: Brandon Price

An investigation determined Brandon Price, an unlicensed individual, made changes to the original engineer design of a structure by placing enlarged beams and allowing torch enlargements of bolt holes without consulting with the engineer of record. Mr. Price agreed to a Consent Order that required him to pay \$225 to the Board for the cost of the investigation, to pay a \$1,000 civil penalty to the State of Alabama General Fund, to cease and desist the offer or the providing of engineering services in the State of Alabama until he obtains an Alabama professional engineer license, and the Order to be a public record.

2018-07-C: Ralph S. Hakel

An investigation determined Ralph S. Hakel, an unlicensed individual, offered engineering services for numerous on-site septic systems without being licensed as a professional engineer, and his firm not holding a certificate of authorization for engineering. Mr. Hakel agreed to a Consent Order that required him to cease and desist the offer or the providing of engineering services in the State of Alabama until he becomes an Alabama licensed professional engineer, to pay \$225 to the Board for the cost of the investigation, to pay a \$1,000 civil penalty to the State of Alabama General Fund, and the Order to be a public record.

2018-18-B: John E. Cover

An investigation determined John E. Cover, professional engineer, was selected for audit of the professional development activities he reported on his 2018-2019 license renewal application. Mr. Cover could only provide documentation that supported 2 PDH of the 40 PDH he reported on his renewal application. Mr. Cover agreed to a Consent Order that required him to complete 28 PDH prior to January 31, 2019 that cannot be used for future renewals, to pay the Board a \$1,000 fine, his license to practice engineering to be suspended for 1 year with the suspension stayed, to be subject to audit of his reported PDH for the 2020-2021 renewal cycle, and the Order to be public record.

2018-23-B: Guigen Wang

An investigation determined Guigen Wang, professional engineer, placed his signature and professional engineer seal on the electrical, plumbing and mechanical engineering design plans that were submitted to a City Building Official that were outside his area of competency. Mr. Wang agreed to a consent order that required him to pay the Board \$250 for the cost of the investigation and a \$2,000 fine, his license was suspended for two years with the suspension stayed, to restrict his professional engineering practice to the area he is qualified by education and experience, and the Order to be a public record.

our NEW LICENSEES

Listed on pages 7, 8 and 9 are the names of the most recent Professional Engineer, Professional Land Surveyor licensees who have been granted licensure following the Sept. 11, 2018 meeting. The list will also include those who have been granted status as an Engineering or Land Surveying Intern:

• PE LICENSEES

DAVID RAY HARRIS
 JESSE ROBERT BROWNING JR
 COOKE DOULGASS FARR LEMONS
 CRAIG STUART ANDERSON
 BRENTON JAMES BARNETTE
 TIMOTHY EUGENE BEAVER
 ROBERT STEVIE BERRYMAN JR
 TYLER JAMES BOWDEN
 WILLIAM SHARKEY BOWERS
 VALERIE LYN COSTELLO
 JUSTIN FIELDS
 LOYD ALLAN GLIDEWELL
 STEPHANE HENRION
 AUSTIN ALEXANDER HERMSEN
 CHRISTOPHER GEORGE HERNDON
 HECTOR JUAN HUERTAS HERNANDEZ
 DERRICK DIONELLE JONES
 BRIAN PATRICK KING
 PAUL HENRY KIRBY III
 MICHAEL JAY LEWIS
 DAVID L. MACLEAN
 PAMELA ANN KIEL MASSARO
 ANDREW MATHIS
 THEODORE JOSEPH MEINERS
 MITCH ALAN OKESON
 KYLE ANDREW SCHLICHT
 MANISH BHAGWANDAS SHAH
 PERRY L. SMITH
 BRADLEY MARK STRINGHAM
 VALTA BRENT TARBET
 ZACHARY MICHAEL WAHL
 WILLIAM JOSEPH WELLS
 TOMMY JAMES WRIGHT
 JAMES ANTHONY ZAUNICK
 SENASE ADANDE KINTI
 MICHAEL EARL BAILEY
 MICHAEL ELLIOTT BELL
 RONALD BRANDON BOND
 CORY MICHAEL BYRD

Congratulations Troy University



Congratulations to Troy University for being recognized as one of the top survey/geomatics programs in the country.

The NCEES Surveying Education Award recognizes programs that have a broad and robust curriculum and best reflect NCEES' mission to advance licensure for surveyors in order to safeguard the health, safety and welfare of the public. This award is in recognition of Troy University's outstanding efforts and is intended to encourage students to engage with other professionals, introduce them to both historical and emerging technology and promote licensure. The NCEES Surveying Education Award (a second win for Troy) brings with it \$10,000.

Pictured presenting the award are: Joey Breighner, Jr., (board member), Dr. Steve Ramroop (Troy), Nathan Johnson (board chair), Steven Taylor (Dean of the College of Arts and Sciences), Dr. Xutang Niu (Troy) and Rusty Blackwell (ASPLS president).

ENFORCEMENT ACTIONS

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2018-24-C: Zhi Feng

An investigation determined Zhi Feng, a licensed architect, placed his signature and professional architect seal on the electrical, plumbing and mechanical engineering design plans that were submitted to a City Building Official without being licensed as a professional engineer in the State of Alabama. Mr. Feng agreed to a Consent Order that required him to pay the Board \$250 for the cost of the investigation, to pay a \$2,000 civil penalty to the State of Alabama General Fund, to cease and desist the offering or the practice of engineering in the State of Alabama, and the Order to be a public record.

2018-26-B : William C. Brett

An investigation determined William C. Brett, professional engineer, was notified of his selection for audit of the professional development activities he reported on his 2018-2019 professional engineer license renewal application; and was unable to produce documents that showed he had completed the reported activities. Mr. Brett agreed to a consent order that required him to surrender his Alabama professional engineer license, to not seek reissuance of the license, and the Order to be public record.



our **INTERACTIONS**

Education through outreach opportunities has been a BELS goal since the better part of 2015. During Fiscal Year 2018, a peak was reached as our Outreach Staff traveled to more than 30 events throughout the State of Alabama. During that span, new doors were opened as trips and relationships rekindled as the staff made a concerted effort traveling to speak on a myriad of topics ranging from the new law change, the need to pursue professional licensure, to ethics, and investigative matters.

our **NEW LICENSEES**

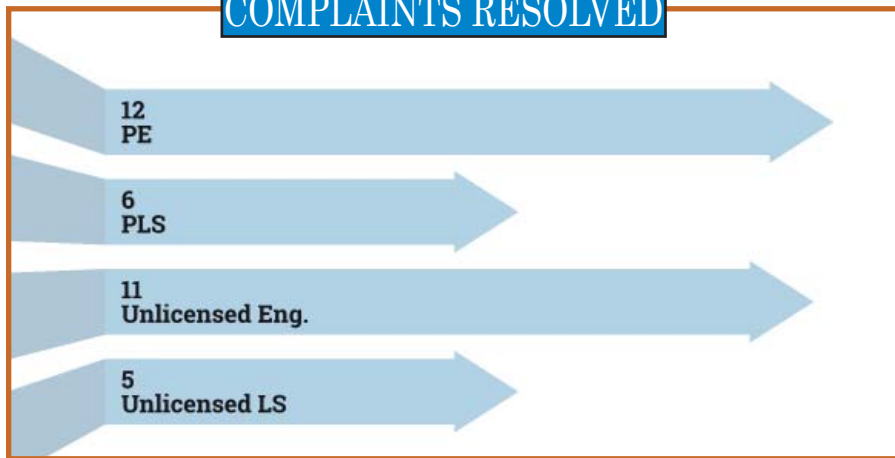
JAMES LINN CORWIN
 NEAL ROBERTS CRAWFORD
 JOSEPH PATRICK CURRY
 MATTHEW JAMES DANOWSKI
 MICHAEL WILLIAM EMMERICH
 MATTHEW JAMES FALLACARA
 STEVEN LESLIE FIELDS
 HAYDEN JAMES FISCHER
 SCOTT ROBERT FLETCHER
 JOHN RANDALL FRENCH
 STEVEN RAY GARRETT
 DAVID NICOLAS GARZA
 RICHARD ALAN GEHSE
 KIMBERLEY IRENE GNAEDINGER
 BRIAN AUSTRUM HAZLIP
 MATTHEW ROBERT HELWIG
 TONY HUFF
 THOMAS GEORGE HYATT
 SCOTT MACK INGALLS
 RYAN ROBERT KUNTZ
 ANDY TA-CHWAN LUONG
 NICHOLAS ANTHONY MARIANO
 WILLIAM JOSEPH MCCONNELL
 JODY MCKENZIE
 WILLIAM OZIAS MONETTE JR

AMES D. MULLINS
 SETH WILLIAM PFEIL
 JASON CHAIM POLLAN
 JOHN KENNETH RALEY
 RONALD WADE RIDEOUT
 MARC DAVID ROSSIGNOL
 MATTHEW DEAN RUSSELL
 ALEXANDER MICHAEL SAWKA
 JOHN THORNE-THOMSEN
 LAREN MICHAEL TUSHIM
 JAMES SAMUEL VANCE
 THOMAS DAVID WOODWORTH
 JACOB BRIAN ACKERMAN
 JOHN T. ALLEN
 RYAN BROOKHART
 FRANCIS JOSEPH BYRNE
 NATHAN JAMES CALDEN
 VINASH CHOWDARY CHUNDURI
 RAYMOND L. COX
 CURTIS ALAN GENTILE
 ALYSIA MITCHELL HAGUE
 ROBERT EDWARD JENSEN
 TIMOTHY JOHN KENNEALLY
 JUSTIN KENDALL PLAISTED
 JOHN HENRY REGAN IV

WILLIAM RICHARD SCHNIER III
 SCOTT ALAN SCHROEDER
 DENNIS PAUL ASHLOCK
 MERRILL WADE ARTHUR
 FRANCIS PHILLIP BAUER
 KYLE MACINTOSH HOYT
 CHRISTOPHER STEWART LUDWIG
 PAUL MICHAEL ROSE
 JEFFREY THOMAS SCHROEDER
 JASON CHRISTOPHER GROSSI
 MITCHELL J. KERNS
 JASON WALTER MARTIN
 CORY ALAN MITCHELL
 HARDY WIDJAJA
 TIMOTHY DRUMM
 CLAYTON EARL BUBECK
 MARK ALAN COATS
 MARTIN ANTHONY GRIFFIN
 MOHAMMAD SAID HABIB
 ERIC OWEN KORN
 JEFFREY WAYNE MIRE
 JARED JEFFREY SCHREMPP

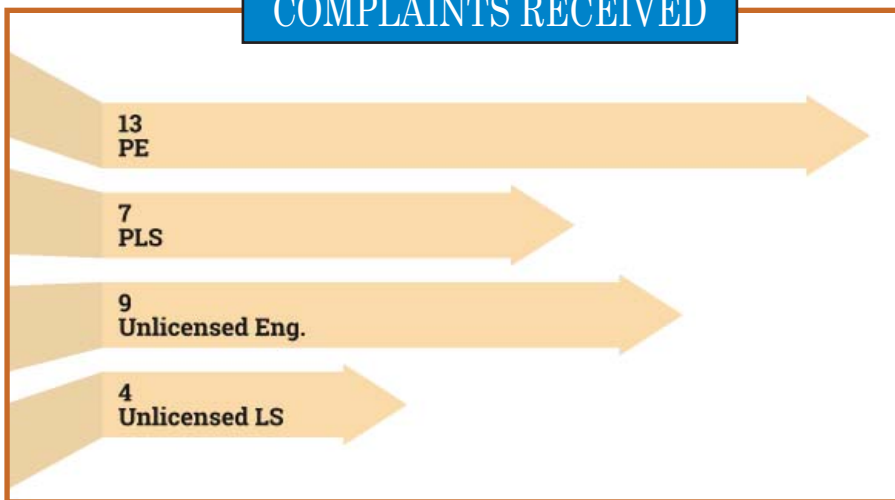
 BYRON DAVID HOWELL (PLS)
 JARROD WAYNE ROWLAND (PLS)

COMPLAINTS RESOLVED



BELS conducts investigations that result in findings of no violation and both formal and informal actions. Informal enforcement actions result in letters of caution which are not part of public record. Formal enforcement actions are public record and may include a fine, probation, license suspension or revocation. In FY 2018, BELS brought closure to 34 complaints.

COMPLAINTS RECEIVED



Any person may file a complaint alleging a violation of the law or rules against any individual licensee, certified intern or corporation, partnership or firm holding a Certificate of Authorization.

Complaints may also be filed against unlicensed individuals or firms that offer or provide engineering or surveying services that violate the Code of Alabama. The complaints must be in writing and be filed with the Executive Director of BELS.

In FY 2018 BELS received 33 complaints regarding professional engineers, professional land surveyors, an engineer intern, and unlicensed individuals or firms offering engineering services.

our NEW INTERNS

- KHATTAB KHALID AL-AMIN
- PHILIP JESUS BEAUCHAMP
- JACOB A. CAMPBELL
- AARON RYLEIGH CHERRY
- DEAN ANDERSON COLE JR
- PHILIP LANE COOK
- JOHN CONNOR CRUMRINE
- JOSUE SILVA-ALENCAR DESOUSA
- RYAN NELSON DUNNE
- AARON WINSTON ETHEREDGE
- NICHOLAS RYAN GARSIDE
- DAVID PAUL GILMORE
- KEVIN JAMES GORDON
- AARON LEE GRANT
- JOHN THOMAS HUBBARD
- LAUREN ELIZABETH LOTT
- NICHOLAS MAURICE LYN
- CAMERON SCOTT MOORE
- JONATHON GRANT REDD
- JESSICA LENETTE SHRONTZ
- BLAKE GARRISON SMITH
- CHARLES ARLINGTON STUMP III
- KEVIN HENRY THORNHILL
- CHAYMAE TOUIZI
- KATHRYN PATRICE TUCKER
- LAURA ROBISON VUKOSAVLJEVIC

The renewal period for Alabama Certificates of Authorization is currently ongoing until January 31. The Certificates can be renewed online at bels.alabama.gov. Also, remember to update any information regarding your Certificate that may have changed within the past year.



The future is closer than you think

Robotics, technological advancements bring forth endless possibilities

By Griffin Pritchard |

BELS Public Information Specialist

In science fiction movies through the years a handful of constants can be seen: (1) Flying modes of transportation be it cars, skateboards or jet packs; (2) the ability to live, function and hold awesome epic battles in space; (3) horrible fashion designs (see Future, Back to the) and of course (4) the rise of the machines. While the first three seem beyond the pale of reality, the fourth item garners a hearty “not so fast my friend” as automation has secured its place among the litany of engineering types and is poised to become a top career field.

According to the American Society of Mechanical Engineers: “Ingenuity and vision are the hallmarks of great engineering. Envisioning the machines of tomorrow is especially important, and some technologies – visible and invisible – could change the way we design and make products.”

During a presentation at the Tuscaloosa (Alabama) ASCE

Winter Conference, a note was made that 65 percent of today’s children will work in a job environment that doesn’t yet exist.

For example – Auburn engineering students created a bot that fetches tennis balls. According to Engineering.com and Auburn University, “Haitham Eletrabi felt like more time was spent chasing after balls than actually playing tennis. After a quick survey of the ball collection options available he felt unsatisfied and went to work on his own design.”

Enter the Tennibot.

The article reads: “Computer vision allows the robot to move about autonomously around the tennis court with two flywheels to intake the balls and deposit them into the bucket.”

But it doesn’t stop there. According to the Opelika-Auburn News – also created an early version of Rosie from The Jetsons. “Opelika’s newest hotel, La Quinta Inn & Suites, has intro-

EMERGING FIELDS

THE FUTURE

From Page 10

- **VALIDATION ENGINEER:**

Validation Engineers (according to the IEEE publication the Institute) “develop and also test manufacturing systems and equipment.” As the economy continues its upward swell, this field is expected to rise along with the boom in production business.

- **ROBOTICS:**

Utilizing CAD, drafting and CAM systems Robotics Engineers “design, test and build robots that are productive and safe to operate.”

- **EMBEDDED ENGINEER**

As more systems become connected and the demand grows for things to be smarter “embedded engineers will be needed to write code, design circuits, ensure quality and implement solutions that keep operating systems running.

- **AEROSPACE:**

Aerospace engineers design vehicles and devices capable to traveling through the skies and the cosmos. They also design missiles and propulsion systems. According to the online publication Tough Nickel (a financial pundit publication) it’s estimated the Aerospace Engineer jobs will grow by 6.1 percent in the coming year and will add around 4,100 jobs to the market.

- **COMPUTER HARDWARE**

Both publication sited list Computer Hardware Engineers as an emerging field. IEEE focuses on the growth of Artificial Intelligence and its importance to the production field. Tough Nickel estimates that, “with their ability to develop the physical components of computer systems,” a combined 8,000 (both direct and related to the field) will be created. Just on the hardware end, growth is around six percent.

duced Alabama’s first delivery service robot,” wrote reporter Ali Selman. “TigerBot, a Savioke-brand robot is able to deliver everything from food and beverages to linens and toothpaste directly to each guest’s room. This delivery-service robot essentially serves as a butler to ensure guests have a comfortable and memorable stay.”

If having a robot deliver your room service bacon-cheeseburger doesn’t make the stay memorable, the fact that it will dance when given a five-star rating has got to help.

The widespread adoption and recent developments in robotics and plant automation systems continue to impact productivity end-to-end, and impact how engineering can do business across whole product lifecycle. This trend has realized tremendous improvements in worker productivity and the talent gap in manufacturing. As another result, there will be significant competition ahead for talented professionals such as instrumentation and controls technicians, automation engineers

“Robots will find their way more and more into our homes as we become more and accustomed to them,” wrote Tj Nguyen, assistant director of Auburn’s Southeastern Center of Robotics Education. “A decade ago, having a Roomba in your house was big deal but we don’t bat an eye today. Robots are taking different form factors that we’re used to – Alexa, Sira and Google are finding their way into more and more homes and are able to control more physical things around us.”

Autonomy is not just in the homes, it’s on the roadway too thanks in part of Uber’s purchase of the startup Otto. During the Tuscaloosa presentation by Paul Walker of HOAR Construction (Birmingham), he highlighted the fact that Otto completed a 120-mile trek in Colorado hauling 51,000 cans of precious cargo: Budweiser.

This happened in 2016 with a human in the cab – sitting in the passenger seat, never once controlling the vehicle – and traveled from Fort Collins to Denver using Interstate 25.

According to CNN Money’s account of the event: “The human who piloted the truck from Anheuser-Busch to the highway shifted to the back of the cab until the truck exited the highway. The driverless tractor-trailer was sandwiched between four Colorado State patrol cars and three vehicles from Otto (the company).

The trip, however, wasn’t spontaneous and came after months of planning and the convincing of Colorado Department of Transportation head Shailen Bhatt. Bhatt, who was a part of the 120-mile convoy, “had overcome reservation about the trip after Otto repeatedly drove the route autonomously with a human behind the wheel but never had to intervene.”

“Moore’s law is still in effect and as the technology gets cheaper, faster and smaller, we’ll see robots in places we haven’t seen before,” Nguyen wrote to BELS. “Hopefully self-driving vehicles will be everywhere and maybe we’ll even see nanobots start to become more feasible for medical use. I’d be a huge fan (if we can get the kinks worked out) of Star Wars-style robotics prosthetics.”

All of this is great and all, but who’s going to build it? This is where what’s old become news again. Tough Nickel (a financial pundits’ online publication), The Institute (IEEE’s online magazine) and Engineering.com have all highlighted the professions of Civil and Mechanical engineering as being vital to the future.

Tough Nickel goes so far as to list Civil as the fastest growing field in the United States between now and 2026. Civils plan and oversee the developments of infrastructure projects such as airports, bridges and dams. It’s estimated that the profession will see a 10 percent growth (over an eight-year span from 2018-2026) and upwards of

OUTREACH

Dr. Seuss says “the more you read, the more things you will know. The more you learn, the more places you’ll go.” That applies to the past fiscal year as outreach efforts spanned the state from Huntsville to Mobile and from Auburn to Mississippi. In 2017, we touted the importance of “Education through Outreach” and attended 15 events throughout the state.

A year later, that effort nearly doubled as BELS’ staff attended 28 events ranging from visits to colleges to exhibiting at home shows.

Our outreach efforts even struck an international tenor when Special Investigator Bob Herbert was invited to participate in the launch of CLEAR’s series of podcasts focusing on different aspects of regulation.

These myriad efforts are aimed at helping the different stakeholder groups (students, professionals and the public) better understand how the Board of Licensure for Professional Engineers and Land Surveyors fulfill their mission of protecting the public health, safety and welfare.

By doubling the efforts and the events over the course of the year, we are better able to take the temperature of the general public and to see how past ventures have worked.

THE FUTURE

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30,000 jobs will be created. Don’t sleep on Mechanical though as they design the systems that make things move: car engines, power plants, machine tools and ventilation equipment. Tough Nickel comments that professions under the Mechanical umbrella will see nearly a nine percent growth and will add around 25,000 jobs to the market. Engineering services alone will account for just under 13,000 new jobs.

So how do robots figure into all that growth?

Nguyen: “Most people don’t realize that people with robotics degrees are in almost every industry. Robotics are obviously a huge part of manufacturing and production.”

He added that robotics can be seen in medical fields and even marine biology.

In some countries, robots are already being used to deliver medicine to hospital rooms. But what’s next?

That’s where Nguyen and SCORE come into play.

“SCORE helps promote robotics wherever we see need in the state (Alabama),” Nguyen wrote. “We are constantly interacting with teachers and students throughout the year by hosting robotics competitions, providing professional development for teachers and running various camps like our drone camp for students. We have built a pipeline of robotics programs that students can be involved in from elementary school to the collegiate level.”

The education isn’t theory-based, which aids the upper level students as they begin to transition from students to professionals.

“We focus on trying to integrate activities into real-world scenarios so that students are focusing on the problem-solving and using robots as a tool in that process,” wrote Nguyen.

The future as seen in cartoons and movies of the past may not be exactly as they pictured it, but it’s not too far off.

NEXT ISSUE

In the next issue of the BELS BULLETIN look for articles focusing on:



- A recap of the annual Future City competition as BELS is a partner for the first time and will be presenting an award.

- An introduction of the latest inductees into the State of Alabama Engineering Hall of Fame

- Enforcement actions and new licensees from the January 15 meeting.