

# Entertainment Engineering

**STARTING SALARY (FOR MECHANICAL ENGINEERING): \$58,600**  
**MEDIAN INCOME (FOR MECHANICAL ENGINEERING): \$80,580**

Entertainment engineering is more than theme park engineering, it can also include aquariums, zoos, casinos, sporting events, trade shows, museums, cinemas and restaurants such as the Hard Rock Cafe and Planet Hollywood. The majority of employers listed do not limit themselves to theme park design. They encompass a wide range of creative activities such as scenery fabrication, mechanical systems, special effects, fiber-optic lighting design, audio/video design, show control systems, manufacturing, software programming, and pyrotechnics just to name a few.



The opportunities available for engineers in this industry are as varied as there are engineers. Positions are available for many different types of engineers including computer engineers, industrial engineers, ride and show engineers, project engineers, architectural engineers, electrical engineers, software engineers, mechanical engineers, structural engineers, and audio/video engineers. Engineers are needed to design the face of what the public sees as well as to support the business of theme parks such as crowd control, research and development, training, and equipment maintenance.

As an engineer, you may accomplish a special connection with your guests is a result of touching their emotions. The real magic of pulling off such an event is in the storytelling. Technology can make us ooh and ahh but its power cannot be compared with the impact of a compelling story.

As an entertainment engineer, or e-factor engineer, you can move an audience to tears, laughter, excitement, fear, or exhilaration. The work of e-factor engineers is an amazing and unique blend of art and science cooked up by people who are passionate about bringing their own and other people's ideas to life.

## Job Outlook

Employment of mechanical engineers is projected to grow 5 percent from 2012 to 2022, slower than the average for all occupations. Job prospects may be best for those who stay abreast of the most recent advances in technology.

Source: US Bureau of Labor Statistics

The long arm of engineering reaches out to us all in every imaginable way. Engineering surrounds and astounds us. It constantly challenges us to better what we have achieved and dares us to take the next step forward into the unknown. E-factor engineering can be compared to making a square peg fit into a round hole. In fact, theme environments often involve corners that are not square, and structures that are intentionally crooked, and so the traditional straightedge approach must be scrapped.

Many professionals pursue e-factor engineering for the excitement, glamour, and gizmos. The glamour of e-factor engineering comes from the Hollywood feel of the industry. This kind of entertainment is designed to make people feel inspired, dazzled, wondrous, loved, and above all else — the rush. Many engineers pursue the e-factor field because they are interested in how things work, taking things apart, or solving problems. Many love going to theme parks, amusement parks, science centers, aquariums, zoos, or any of the other myriad of e-factor venues. Many love seeing the latest high-tech movies or are fascinated by lighting and special effects. Whatever your reason may be for liking it, there is a place for you in this specialized field. However, nobody said it was going to be easy.

The excitement of opening an attraction you worked on to the public as well as exploiting the technologies of the future make e-factor engineering a dream job. In the spirit of creativity, you can work hard, innovate, and bring your imagination to life for millions of friends and families in the world. Your job of making people happy can be highly contagious — one smile usually leads to another. According to Bob Thomas, author of *Walt Disney, An American Original*, “Walt (Disney) rejected a design for one building with the comment: ‘I think the fellow was attempting to monument himself rather than designing something that is for people.’ Walt impressed on his designers again and again that he wasn’t seeking architectural masterpieces. ‘All I want you to think about,’ he told them, ‘is that when people walk through or ride through or have access to anything you design, I want them, when they leave, to have smiles on their faces. Just remember that; it’s all I ask of you as a designer.’”

In this industry you need to get ready to work hard and put in long hours. Project-based entertainment engineering is full of deadlines and countless details that must be worked out. According to Maris Ensing of Mad Systems, the most important skill an engineering student can acquire is “no need for sleep, if that can be cultivated as a skill.”

Entertainment companies are often downsizing or hiring because their needs change every time a new attraction is contracted. Therefore, the market is very competitive. Maris Ensing says, “You need all the skills you can get. Straight electrical, electronics, computer skills, software, mechanical, optical, anything you can learn: do it! Learn to learn. It’s up to you to make it happen, and it’s up to you to make sure they happen right. Almost right is not an option. From incoming wiring to speaker wiring to amplifiers, lighting, dimmers, strobes, special effects, sensors, grounding, emergency stops, computers, motion bases, projectors, smoke machines, hanging, fixing and mounting things to whatever crazy thing you bump into next. Do it as well as you can, and make sure it’s as good as it needs to be! By the time the job is in and you leave the site, be proud of the part you’ve played in it.”

# Glossary of Terms

Amusement - something (such as an activity) that amuses or entertains someone

Animatronic - of, relating to, or being a puppet or similar figure that is animated by means of electromechanical devices

Automation – the technique of making an apparatus, a process, or a system operate automatically

Calculation - studied care in analyzing or planning

Cinema – the art or technique of making motion pictures

Component - one of the parts of something (such as a system or mixture) : an important piece of something

Constraint - something that limits or restricts someone or something

Construct - to make or create

Entertainment - the act of amusing or entertaining people

Fatigue - the tendency of a material (such as metal) to break after being bent or moved many times

Hydraulic - operated by the pressure of a fluid

Lighting - the use of light for a particular purpose in a movie, play, etc.

Manipulate - to move or control (something) with your hands or by using a machine

Mechanized - to provide with mechanical power

Replica – an exact or very close copy of something

Resin – an artificial substance that is similar to natural resins and that is used to make plastics

Robotics – technology that is used to design, build, and operate robots

Sensation - a state of excited interest or feeling

Simulation – something that is made to look, feel, or behave like something else

Scenery – the walls, furniture, trees, etc., that are used on a stage during a play or other performance to show where the action is taking place

Spectacle - something exhibited to view as unusual, notable, or entertaining; especially : an eye-catching or dramatic public display

Stagecraft – the effective management of theatrical devices or techniques

Variable – able or likely to change or be changed : not always the same

Venue - the place where an event takes place

Visual - relating to seeing or to the eyes